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British Museum (Natural History)

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A catalogue and reclassification of the Ichneumonidae (Hymenoptera) described by C. G. Thomson

M. G. Fitton

Entomology series
Vol 45 No 1

27 May 1982

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A catalogue and reclassification of the Ichneumonidae (Hymenoptera) described by C. G. Thomson

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Synopsis

The 957 nominal species of Ichneumonidae (all from the western Palaearctic region) described by C. G. Thomson are catalogued. An attempt is made to account for the type-material of all species and the generic placements of the species to which the names apply are established after study of the types. Types of 74 species are lost and 9 names remain *nomina dubia*. Lectotypes are designated for 116 species and 103 new combinations are established. One neotype is designated and one replacement name is proposed.

Introduction

The Ichneumonidae is one of the largest families of animals. More than 10000 species have been described from the western Palaearctic region alone. Because of their parasitic habits they are of great economic importance and biological interest. However, studies of their 'biology' depend upon a sound and accurate knowledge of their taxonomy. It is unfortunate that the taxonomy of the western Palaearctic fauna is currently more confused and in need of attention than that of any other zoogeographical region. The main reason for this is that the results of the outstanding work over the past forty years by Henry Townes and his co-workers, on the taxonomy and classification of the family, have now been applied to all other regions and have wrought order from chaos. There is a firm base for future systematic studies on the family in these areas. A similar base, in the form of comprehensive modern 'catalogues', is needed for the western Palaearctic. The word catalogue is used with some reservation because it tends to convey the wrong impression of the kind and quality of studies needed to produce such works, for a group as large and as difficult as the Ichneumonidae. This paper on the Thomson species is intended as a contribution to a complete catalogue of the western Palaearctic Ichneumonidae.

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C. G. Thomson is generally acknowledged to have been one of the most able hymenopterists of his period. He had a talent for distinguishing closely related species and he described a very large number of new species, including 957 Ichneumonidae, all from Europe and mainly from Sweden. However, his ability is not fully demonstrated in his publications; he lacked a type-concept; and he neglected the proper labelling of material. The existence of these deficiencies perhaps helps to explain how he was able to be so prolific; and, together with the recent revolutionary changes in the classification and taxonomy of the Ichneumonidae, they now limit seriously the use which can be made of his work. This paper attempts to place all of the species of Ichneumonidae described by Thomson in the currently-accepted generic classification of the family. This sort of work must precede revisionary studies because, if such studies of genera or higher taxa are to have a lasting value, one of the essential prerequisites is a knowledge of the described species which belong to them. Because of the vast literature this problem has bedevilled taxonomic work on many groups of European insects, but it is especially severe in the large and difficult families of parasitic Hymenoptera such as the Ichneumonidae.

That the work of correctly placing the already-described species of western Palaearctic Ichneumonidae cannot be achieved successfully, as revisionary studies are undertaken, can be demonstrated easily by reference to the Thomson species. For instance, in a revision of *Dichrogaster*, a small distinctive genus with nine species in Europe, Horstmann (1973*b*) included only two of the four Thomson species which belong in it (Horstmann, 1976*b*). Thomson originally described three of these species in *Hemiteles* and one in *Phygadeuon*. Recognition of the genuine types of Thomson's species has also caused problems (the reasons for which are fully explained in the sections on labelling of specimens and recognition of types). Of about 400 specimens designated as lectotypes or recognised as holotypes of Thomson species between 1966 and 1978 more than twenty-five can now be shown not to have been original material of the species concerned and therefore to be invalid. For example, Aubert (1976*b*: 271) designated as lectotype of *Mesoleius frontatus* Thomson a specimen labelled '50', the significance of which was not stated. However, Aubert had the handwritten label upside down; it was really 'OG', an abbreviation for Östergötland. Since the species was described from Ystad in Skåne this specimen could not be a type. These sorts of problems can only be solved by comprehensive studies of all species described by an author and of his methods, collections and idiosyncracies.

The generic classification of the Ichneumonidae which is the basis of the placements given in this paper is that published by Townes (1969; 1970*a*; 1970*b*; 1971). This work does not cover the subfamily Ichneumoninae, in which case Townes, Momoi & Townes (1965) and Perkins (1959; 1960) are followed. Placements of species of Anomaloninae and Ophioninae were made by I. D. Gauld and follow his work on these groups (Gauld, 1976; 1979). The classification of parts of the Phygadeuontinae and Tersilochinae takes into account some changes and new genera proposed by Horstmann (1971*b*; 1974*b*; 1976*a*; 1978). Aubert (1976*b*), Frilli (1973) and Horstmann (1979*a*) have made particular studies of the Thomson species originally described in *Mesoleius*, *Phygadeuon* and *Hemiteles* respectively. In these three genera, where I have not felt the need to check, the generic placements are credited to these authors. All species synonymies are given on the basis of the published opinions of competent workers (to which references are given).

C. G. Thomson

The following biographical information, relating particularly to Thomson's work on the Hymenoptera, is taken mainly from the obituary by Bengtsson (1900).

Carl Gustav Thomson was born in the province of Skåne on 13 October 1824 and died in Lund on 20 September 1899. He succeeded Dahlbom as curator of the entomological collections at the University of Lund. He was extremely productive: his first paper appeared in 1851 and his total entomological publications exceeded 8800 pages. Coleoptera were his initial interest but he soon became involved with the work on Hymenoptera which occupied him until his death. He was a popular teacher of entomology and students were sometimes given specimens, from his collections, of the species dealt with in his lectures.

The Proctotrupoidea was the subject of his first important work on Hymenoptera. Between

1871 and 1879 he published the five volumes of *Hymenoptera Scandinaviae*. The *Opuscula Entomologica*, issued in 22 parts between 1869 and 1897, included all of his major work on the groups of Hymenoptera not covered in *Hymenoptera Scandinaviae*. He paid for the printing of the *Opuscula Entomologica* himself. Publication ceased in 1897 because problems with his eyesight put an end to his taxonomic work. Of the Hymenoptera, only the Formicidae and Mymaridae did not receive his attention.

Although he described over 2400 new species (including more than 2100 Hymenoptera) he apparently regarded his work on higher classification as more important. He dealt mainly with the Swedish fauna and collected most of the material on which he worked himself. The 'biology' as well as the morphology of the species interested him and he spent a lot of time in the field. In summer he went on walking tours, mainly in southern Sweden (including most parts of Skåne). He also visited Blekinge, Halland, Småland, Öland and Gotland. He was often accompanied by C. D. E. Roth. At the end of the 1860s he went twice to Norrland and in 1871 visited Jämtland. He travelled abroad to Germany and in 1872 made a long trip to Germany, Austria, Switzerland and France, during which he visited many museums and saw important collections (including those of Fabricius and Hartig).

Thomson did not spend much time preparing specimens, which were often pinned alive in the field. At the time of his death his collection of Hymenoptera comprised about 80 000 specimens representing about 7000 species and was housed in 78 cabinet drawers.

Acquisition of Thomson's collections by the University of Lund

Thomson's collections were his own private property. He himself sold his collection of Coleoptera (but not the 'duplicate' collection) to Berlin (see Charpentier, 1972). In November 1899, after his death, his daughter offered the remaining collections for sale to the university. She said that Thomson had valued the collections at between 20 000 and 30 000 Kr. but she asked for only 8000 Kr. Together with the written offer to the university she included a synopsis of the collections. The Ichneumonidae occupied 35 cabinet drawers and there were about 30 boxes of 'duplicate' material. The collections were purchased by the university on 23 January 1900.

Manuscript and other material associated with the collections

Thomson's correspondence is deposited in the main university library in Lund. He was in contact with workers in Sweden and in Europe, including most contemporary ichneumonid specialists. Many of the letters are accompanied by lists of species.

The library of the Zoological Institute has Thomson's personal copies of the *Opuscula Entomologica*, etc. They contain marginal notes made by Thomson. The notes are more numerous in the earlier parts and include new synonymy and descriptions of new species. Unfortunately, they have not proved helpful in tracing the type-material that is apparently missing from the collection.

The Entomology Museum of the Zoological Institute has little manuscript material that is relevant to the Ichneumonidae. It includes the letter from Thomson's daughter offering the collections to the university (see above) and a few lists, including one of ichneumonids from Holmgren's collection.

The collection of Ichneumonidae

Thomson's 'main' collection of Ichneumonidae is contained at present in parts of two cabinets (numbered 395 and 396). It occupies 50 drawers (numbered 31 to 80). The arrangement of the collection follows the *Opuscula Entomologica*, thus: Ichneumonidae (drawers 31–41), Cryptidae (41–50), Pimplidae (50–56), Agriotypidae (56), Ophionidae (56–65) and Tryphonidae (66–80).

The 'duplicate' ichneumonid material is contained in various cabinet drawers (in cabinets 398, 399, 403 and 404) and in numerous separate boxes (cigar boxes etc.). The boxes are kept in cupboard 324. Parts of the duplicate collection (boxes as well as drawers) are arranged taxonomically, with labels for genera and species. In some parts the arrangement is tidy and it is possible to relate specimens to particular labels. In other parts there is a confusion of material. Some boxes contain material from a single collector (e.g. Lethierry); others contain an assortment. The contents of some boxes are partly sorted and named. The duplicate collection includes Dahlbom, Ljungh, Holmgren, Wesmael and Zetterstedt material. There is type-material of Thomson species and there may be type-material of other workers species (notably Holmgren and perhaps Wesmael). Thomson apparently received a collection of Wesmael ichneumonids (currently in two drawers in cabinet 399). It is still 'as received', each specimen bearing a number (1–249). No key to the numbers, and thus Wesmael's identifications, has been found.

The 'main', formal collection was arranged in its present form by Simon Bengtsson. Bengtsson was appointed curator of the entomological collections in 1900 and one of his first duties was to take care of the then newly-acquired Thomson collections and transfer the Hymenoptera to three new cabinets. It is known that the formal collection corresponds to Thomson's own 'main' collection but that the arrangement may have been changed (if necessary) to correspond with the *Opuscula Entomologica.* The 'duplicate' collection appears to be as Thomson left it.

The only significant curatorial work on the collection since Bengtsson's time has been the recognition and labelling of type-material by specialists and, more recently, the addition of labels (in the form '1978 329') to specimens sent out on loan. These labels are not removed when the specimens are returned to the collection and they form, in conjunction with the 'loan journal', a useful record of borrowers of material. Some years ago a few specimens were labelled 'typ' or 'typi' (e.g. *Cteniscus genalis*) as part of a curatorial exercise attempting to identify types/syntypes in the museum collections (not just the Thomson collection) (H. Andersson, pers. comm.).

There are surprisingly large numbers of specimens missing from the collection (deduced from information on localities, sexes and specimens given in the *Opuscula Entomologica*). There are several possible explanations for this but none is supported by more than circumstantial evidence.

There is some *Anthrenus* damage in the collection but very little evidence of attacks in the present cabinets. Perhaps badly damaged specimens, including type-material, were discarded at some time by Thomson, or by Bengtsson at the time of the transfer to the present cabinets.

The collection was undoubtedly a 'working' collection and Thomson may have redetermined material at various stages, changing its position in the collection. Some such displaced specimens have already been identified as types.

It is probable that Thomson exchanged material with other European workers. As far as is known, however, he did not give any of his Swedish material to other Swedish workers (H. Andersson, pers. comm.), with the possible exception of specimens of common species given to students (Bengtsson, 1900). He may have returned to other Swedish workers specimens which they sent to him. He returned to Jensen and to Drewsen material, including types now in Copenhagen, which they collected in Jutland and Zealand.

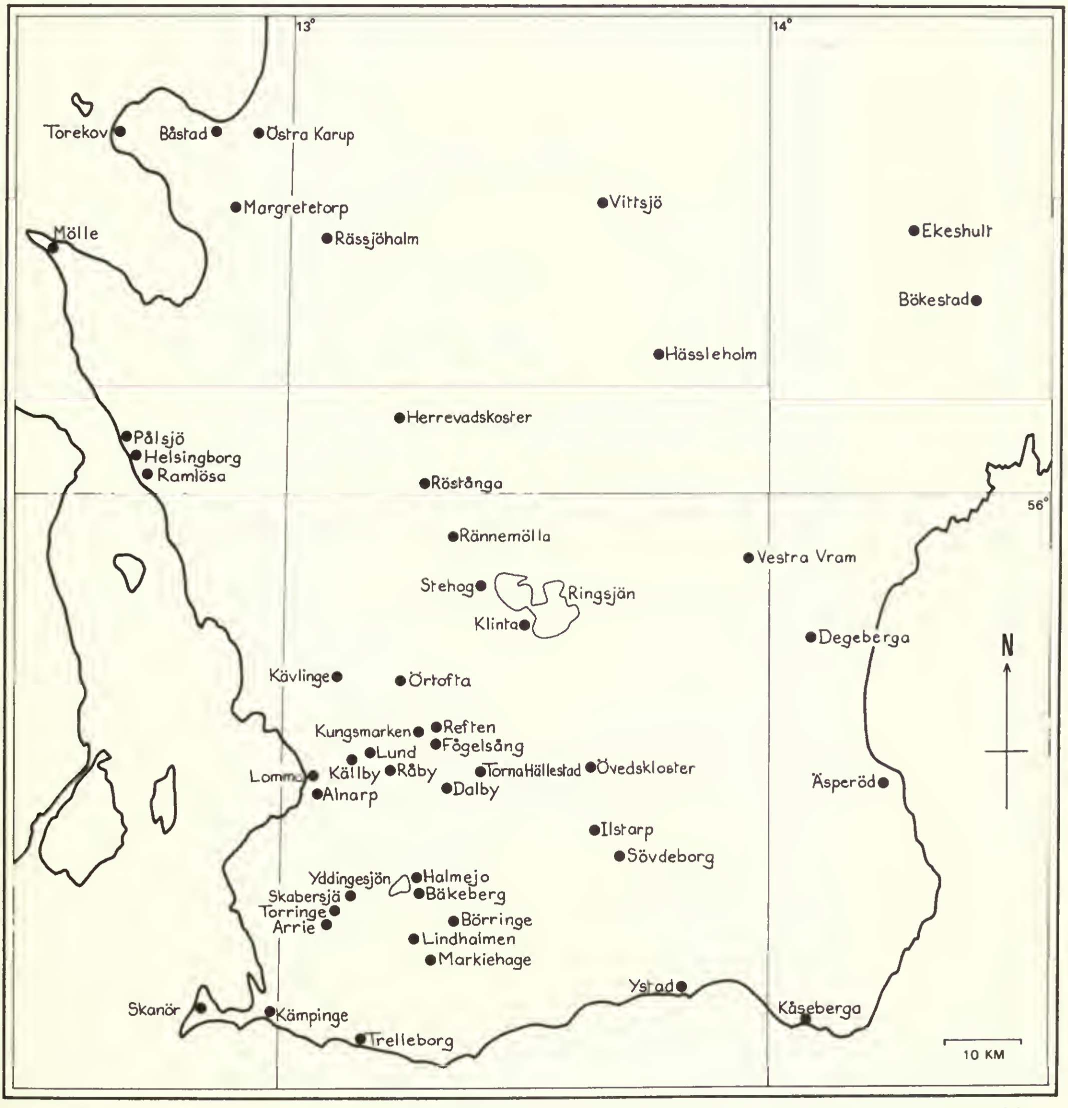
It is difficult to assess the effects of the transfer to new cabinets and associated curatorial work by Bengtsson. Thomson's arrangement was almost certainly not as precise and neat as the present one. Bengtsson replaced Thomson's handwritten 'cabinet' labels by type-written ones. In the case of generic names Thomson's labels were concealed beneath the new ones. The species name labels were folded and transferred to the pin of the first specimen in the species series. The type-written labels follow the *Opuscula Entomologica* exactly and include the typographical errors, e.g. *Microcryptus 'arrideus'* instead of *'arridens'* as on Thomson's own cabinet label and *Exetastes 'guttiferm'* instead of *'guttifer'*. In some cases Thomson's cabinet label name differs from the published one, e.g. *Catoglyptus 'fusiventris'* instead of *'fusiformis'*—presumably he changed his mind between writing the label and writing the manuscript for publication.

Labelling of specimens

Apart from Thomson's cabinet labels (added to specimen pins by Bengtsson (see note above) and of no significance whatsoever in the recognition of types) material in the collection is usually very poorly labelled. The specimen labels are generally small squares of paper with an abbreviated locality name and sometimes a date. The locality labels may be handwritten or printed. Occasionally the locality name is given in full. Some specimens have no locality name or abbreviation but instead have a small square of coloured paper. Unfortunately, the meaning of only one colour is known: green indicates Ringsjön. There are two kinds of green squares, very small dark ones and slightly larger (up to about 3 × 4 mm) paler, brighter ones. Interpretation of the small dark labels as indicating Ringsjön is now generally accepted (for example, Huggert, 1973: 107; Aubert, 1976*a*: 154) and I have discovered specimens bearing both a green square and a printed label 'Ringsiö'. Similar systems of coloured labels were used by other contemporary and earlier workers, for example Zetterstedt (R. Danielsson, pers. comm.).

Specimens sometimes also have other labels, usually of one or more of the following four kinds: a sex sign (printed); the name of a collector or collection; an additional locality label giving a province or country; an identification.

The style of label with a locality abbreviation used by Thomson was also popular with other contemporary collectors—most notably C. D. E. Roth who often accompanied Thomson on his collecting trips. Thomson's and Roth's handwriting styles were similar and most labels are


13°
14°
56°
Torekov
Båstad
Östra Karup
Margretetorp
Rässjöhalm
Vittsjö
Ekeshult
Bökestad
Mölle
Hässleholm
Herrevadskoster
Pålsjö
Helsingborg
Ramlösa
Röstånga
Rännemölla
Vestra Vram
Stehag
Ringsjön
Klinta
Degeberga
N
Kävlinge
Örtofta
Kungsmarken
Reften
Lund
Fogelsång
Källby
Råby
Lomma
Alnarp
Torna Hällestad
Övedskloster
Dalby
Äsperöd
Ilstarp
Sövdeborg
Yddingesjön
Halmejo
Skabersjä
Bäkeberg
Torringe
Arrie
Börringe
Lindhalmen
Markiehage
Ystad
Skanör
Kämpinge
Kåseberga
Trelleborg
10 KM

Map 1 The Swedish province of Skåne showing the type-localities of species of Ichneumonidae described by C. G. Thomson.

difficult to identify with certainty as the work of Thomson, although Roth's labels usually have a date (day/month) below the locality abbreviation. The labels are poorly written and hard to interpret until one is familiar with the forms of individual letters and the locality names from which the abbreviations are derived.

A list of abbreviations used for Swedish localities is given below. It is not exhaustive and relates mainly to ichneumonid type-material. The spelling used by Thomson is given first followed by the modern equivalent where this differs. A [?] indicates that there is doubt about the form of the abbreviation, its equivalence to the locality given or both. [*Note*. The Swedish letters å, ä and ö properly follow z in the Swedish alphabet but for the purposes of alphabetical order are treated as a, a and o respectively in this list.] The localities in Skåne are shown on Map 1.

Abbreviation	*Locality*
Alnp	Alnarp, Skåne
Alp	*see* 'Alnp'
Ar	Arrie, Skåne
Åre	Åreskutan, Jämtland
Båst	Båstad, Skåne
Bgs	Bögestad = Bökestad, Skåne
Bkbg	Bökeberg, Skåne
Bl	Blekinge
Boh	Bohuslän
Bohl	*see* 'Boh'
Bök	*see* 'Bkbg'
Böks	*see* 'Bgs'
Bör	Börringe, Skåne
Bs	*see* 'Bgs'
Dby	Dalby, Skåne
Deg	Degeberga, Skåne
Dg	*see* 'Deg'
Dgb	*see* 'Deg'
Ekh	Ekeshult, Skåne
Esp	Esperöd = Äsperöd, Skåne
Fg	Fogelsång = Fågelsång, Skåne
Fsg	*see* 'Fg'
G	Gottland = Gotland
Gbg	Göteborg
Gotl	*see* 'G'
Gott	*see* 'G'
Hall	Halland
Hbg	Helsingborg, Skåne
Hels	*see* 'Hls'
Hg	*see* 'Hbg'
Hhm [?]	Hässleholm [?], Skåne
Hkl	Herrevadskloster, Skåne
Hlm	Holmia = Stockholm area
Hls	Hälsingland
Hma	Holmeja, Skåne
Hme	*see* 'Hma'
Holm	*see* 'Hlm'
Ilsp	Ilstorp, Skåne
Jtl	Jemtland = Jämtland
Kalm	Kalmar, Småland
Kås	Kåseberga, Skåne
Kfge	Kjeflinge = Kävlinge, Skåne
Kgsm	Kungsmarken, Skåne
Kpe	Kempinge = Kämpinge, Skåne
Krp	Östra Karup, 'Halland' [= Skåne]
La	Lomma, Skåne
Lap	Lappland = Lapland [usually assumed to be Swedish Lapland]
Lapp	*see* 'Lap'

Ld	Lund, Skåne
Lhn	Lindholmen, Skåne
Lom̃a	*see* ‘La’
Löp	Löparöd, Skåne
Lpl	*see* ‘Lap’
Marg	Margretetorp, ‘Halland’ [= Skåne]
Mark	Markaryd, Småland
Möl	Mölle, Skåne
Mrki	Markiehage, Skåne
Norl	Norrland
Norr	*see* ‘Norl’ [This abbreviation is easily confused with ‘Norv’ = Norvegica = Norway.]
Ö	Öland
Oel	*see* ‘Ö’
O.G.	Östergothland = Östergötland
O Got	*see* ‘O.G.’
Öke	Öfvedskloster = Övedskloster, Skåne
Ört	Örtofta, Skåne
Pål	Pålsiö = Pålsjö, Skåne
Råb	Råby, Skåne
Raml	Ramlösa, Skåne
Rfn	Reften, Skåne
Rhm	Ryssjöholm = Rössjöholm, Skåne
Rön	Rönnemölla, Skåne
Röst	Röstånga, Skåne
Rötå	*see* ‘Röst’
Rshm	*see* ‘Rhm’
Rsiö	Ringsiön = Ringsjön, Skåne
Rsjö	*see* ‘Rsiö’
Sbg	Söfdeborg = Sövdeborg, Skåne
Scan	Skåne
Sk	*see* ‘Scan’
Skan	Skanör, Skåne
Skb	Skabersjö, Skåne
Sm	Småland
Smol	*see* ‘Sm’
Snör	*see* ‘Skan’
Ste	Stehag, Skåne
Steh	*see* ‘Ste’
Stkm	Stockholm
Tbg	Trelleborg, Skåne
Tkov,	Torekov, Skåne
Tn [?]	Törringelund [?], Skåne
Tör	Törringe, Skåne
Trkv	*see* ‘Tkov’
Tve	Tvedöra = Torna Hällestad, Skåne
V.G.	Vestergöthland = Västergötland
V.W.	Vestra Wram = Västra Vram, Skåne
Witt	Wittsiö = Vittsjö, Skåne
Wml	Vermland = Värmland
W.W.	*see* ‘V.W.’
Yd	Yddinge, Skåne
Ydd	*see* ‘Yd’
Ys	Ystad, Skåne

When labelling material Thomson apparently ‘bracketed’ together adjacent localities. Thus, specimens of a species stated in the description to come from Pålsjö may be labelled ‘Hbg’ (= Helsingborg), Pålsjö being a district of Helsingborg. (Other specimens are actually labelled ‘Pål’.) The terms Norrland and Lappland were used rather imprecisely and sometimes interchangeably by Thomson. Norrland is the area of Sweden north of and including the provinces

Härjedalen and Hälsingland. Species stated to come from Lappland are often labelled Norrland and vice versa. A list of the localities which it is assumed Thomson 'bracketed' is given below.

Helsingborg includes	Pålsjö
Ringsjön includes	Klinta Stehag
Yddinge includes	Holmeja Bökeberg
Norrland includes	Lappland Jämtland Hälsingland

Specimens from particular collectors or collections were known by Thomson to come from a particular locality. For instance, Ljungh specimens come mainly from Småland and if Småland is given as a locality for a species the relevant specimens may actually be labelled 'Col. L-gh' but without a locality label. Rudolphi collection specimens originate mainly from Hälsingland and Fallén specimens from Äsperöd (near Kivik).

Notes on the recognition of type-material and on the selection and designation of lectotypes

Thomson did not have a type concept in any modern nomenclatural sense. He made no attempt to preserve or label in any particular way the specimens which were the bases of his descriptions of new species.

Usually Thomson gives no direct details of specimens with original descriptions, only the localities or more general areas where the species had been found, such as 'Funnen vid Holmeja i närheten af Yddingesjön' and 'Funnen vid Degeberga i Skåne'. For several species much less precise locality information is given, for example, 'Ej sällsynt i norra och medlersta Europa', or sometimes none at all. Localities outside Skåne are often only given at the level of province ('Öland' or 'Norrland', for example) or country. In the latter case Thomson may not have been able to decipher abbreviations, read handwritten labels or ascertain the correct geographical positions of the localities of material obtained from foreign workers. Information in addition to the locality, when any is given, includes habitat, date, collector, an indication of abundance and host data. Examples, 'Funnen vid Kjeflinge i barrplanteringen', 'Funnen i September vid Örtofta nära Lund', 'Funnen talrikt vid Ilstorp i Skåne af Conservator C. D. E. Roth', 'Sällsynt; funnen på sandmarker på Öland' and 'I München utkläckt ur *Thecla Betulae* af D: r Kriechbaumer'. More precise information about the specimens themselves is given only rarely, and often when there was only one, for example, 'Exemplaret, en hona, är funnet på Gottland' and 'Endast ett ex. från södra Frankrike (Coll. Lethierry)'.

Thus Thomson's lack of attention to original material; the inadequate published information; the poor labelling of specimens; and changes in the arrangement of the collection subsequent to publication all hinder recognition of type-material. Indeed, for most species it is impossible to be *absolutely* certain which specimens are types. On the other hand this combination of poor information gives wide scope in deciding which specimens are possible types. It also leaves open the possibility that a specimen chosen as a primary type may be shown, at some later date and in the light of further evidence, not to have been used as the basis of an original description. However, practical considerations justify the selection of single primary type-specimens (usually lectotypes) to serve as stable bases for the nomenclature of the species.

Of the specimens standing under the name of a Thomson species in his collection I have recognised as syntypes all those which are in agreement with the description and with the other information (on localities, etc.) given in the original publication. This latter qualification would perhaps be better expressed as lack of disagreement because, for example, where Thomson cites a locality within a province and there are specimens labelled only with the name of the province they have been accepted as syntypes. Thomson's subsequent references to his own species are sometimes helpful in deciding on the limits of a syntype series. Syntypes of some species are in other collections. For a few species specimens under other names have been regarded as syntypes, usually on the basis of precise agreement with descriptions and other information, and evidence of changes in that part of the collection subsequent to the relevant publication.

It is not always easy, using the above criteria, to decide whether or not a particular specimen should be included in a syntype series. Problems are caused by minor disagreements with descriptions; illegibility of labels; interpretation of locality abbreviations on labels and of coloured tags; and differences between localities as published and as given on labels. Agreement of specimens with descriptions calls for a subjective judgement, sometimes open to alternative opinions. The questions relating to labelling and localities are dealt with in the previous section on labelling of specimens. Each case has to be judged on its individual merits, paying attention to the utility of the particular situation.

Thomson described many new species from single specimens (holotypes). In some cases there can be no doubt, for example, 'Ett exemplar från Småland'; in others it must be inferred from the published information together with the fact that there is only one specimen in the collection. Some workers object to recognition of specimens of the latter kind as holotypes. In cases which I consider doubtful I have cited such specimens as single surviving syntypes.

Any member of a syntype series is eligible for designation as lectotype of the nominal species concerned. Lectotypes have already been designated (published) for a lot of Thomson's species. Many others have been selected (labelled) but not yet published. Lectotypes already selected but not published are designated in the present work, but where no lectotype has been selected details of the syntype series are given. Only a few lectotypes have been selected and designated by me, usually in cases where previous designations are invalid for one reason or another. Lectotype designations are best made in the context of a complete revision of the group to which the species concerned belongs. However, for reasons of practicality it was thought desirable to publish here the selections already made by other workers (some as long ago as 1954).

A number of the lectotype designations already published call for comment. Several are casual in the extreme and need careful consideration of their validity in relation to the relevant provisions of the *International Code of Zoological Nomenclature*. Others, such as Aubert's lists (1966; 1968; 1972) of indiscriminately chosen species, have been published as ends in themselves. Much more attention must be paid to the publication of lectotype designations. There are too many references such as 'lecto. des Townes, 1958', not meaning that there is a designation published by Townes in 1958 but that the specimen was labelled by Townes in that year. It often happens that such a reference to the label is the first publication of a lectotype for that species. Are such references valid designations? For practical reasons they are best accepted as such but the situation is far from satisfactory. Editors of journals, as well as authors, must take some of the blame for this state of affairs.

Thomson's use of names for subgeneric categories

Thomson's use of names for 'subgenera' was inconsistent and is difficult to interpret. This inconsistency is not surprising in work published over a long period but, as a consequence, determining the original subgeneric (and sometimes generic) placements of species is not always easy.

Even when Thomson used subgenera clearly he often prefixed the name of each species with the initial letter of the subgeneric and not the generic name, for example, in *Mesochorus* (1886*a*: 327–344). Workers who have not studied Thomson's work properly have been misled by this practice into citing incorrectly original generic placements.

Of more importance is Thomson's habit of giving genus-group names in parentheses at various points in his keys to species. The names used in this way are mainly those originating from Foerster's work (see Perkins, 1962: 387). In some cases the rank of such names as subgenera is clear because Thomson gives a 'Conspectus subgenerum' at the beginning of the genus, sometimes including synonymy, for example, *Megastylus* (1888*b*: 1310). In other cases Thomson does not give such an indication or the names are given so as to apply to groups of species within subgenera, for example, the use of *Myriarthrus* within *Megastylus* subgenus *Megastylus* (1888*b*: 1314). Thus, it is not always clear whether the names apply to formal subgenera; formal infra-subgeneric categories; informal groups of species; or are included for purposes of synonymy. They are important because they are often the first association of species with Foerster generic names (Perkins, 1962). Subsequently the names have been cited most frequently as subgenera. Except for those used by Thomson infrasubgenerically they are treated uniformly as subgenera in the present work, but because of the doubt about many of them the catalogue section is arranged in alphabetical order of binominal, and not trinominal, combinations.

Format and arrangement of catalogue

The catalogue section is arranged in alphabetical order of the original binominal combination (that is, disregarding any subgeneric component of the name). The nomenclatural summary which follows the catalogue and the index provide entry into the catalogue via species names, subgeneric placements and current combinations.

For each nominal species the entry is arranged in the following sequence:

Name; date and page reference of original publication; status and sex of primary type(s); type-locality; type-depository; lectotype designation or reference to previous valid type-restriction (when necessary).

Details of the labels on the specimen(s).

Notes.

A statement, prefixed '*Identity*', on the generic placement and synonymy of the species.

The following points should be noted with regard to these data.

The name is given as published except that the orthography is altered to comply with Articles 26, 27, 28 and 32 of the *Code* when necessary (in which cases the form of the name as published is also given).

Swedish type-localities are given as cited by Thomson with the addition of the names of the country and province (when necessary) and the modern spelling (when different).

Names of type-depositories are abbreviated as in the list below. Where types are lost this is stated in place of a depository. The collections from which Thomson described species are given after each depository.

CM, Norwich	Castle Museum, Norwich, England (Bridgman collection)
NM, Göteborg	Naturhistoriska Museet, Göteborg, Sweden (G. F. Möller collection)
NR, Stockholm	Naturhistoriska Riksmuseet, Stockholm, Sweden (Holmgren collection)
UZI, Lund	Universitetets Zoologiska Institutionen, Lund, Sweden (Thomson collection)
ZM, Copenhagen	Zoologisk Museum, Copenhagen, Denmark (Drewsen, Jensen and Wustnei collections)
ZSBS, Munich	Zoologische Sammlung des Bayerischen Staates, Munich, West Germany (Kriechbaumer and Foerster collections)

For specimens from Thomson's own collection details are not given of labels added since Thomson's death (except for the cabinet labels which were transferred to the first specimen in each series by Bengtsson). For each label an indication is given (in square brackets) of whether it is handwritten or printed. Except for a few species with large syntype series, all primary type-specimens have individual modern labels showing their identity and status.

Catalogue

Acanthocryptus nigriceps, 1883: 868. Syntype 1 ♂, SWEDEN: Småland, Calmar [= Kalmar], Hossmo (UZI, Lund).

Labels. Hossmo 4/6 70 [hand]; Kalmar [hand]; nigriceps [Thomson cabinet label].

Gravenhorst's specimen (1829*b*: 676. *Phygadeuon quadrispinus* Var. 1. ♂) [not examined] is also a syntype of this species. Thomson mis-spelled the name of the Gravenhorst species as *quadrispinosus* instead of *quadrispinus*.

Identity. ? *Rhembobius nigriceps* (Thomson).

Acanthocryptus nigricollis, 1883: 868. Lectotype ♀, SWEDEN: Skåne, Båstad (UZI, Lund), by designation of Aubert, 1966: 129.
Labels. Båst [hand]; nigricollis [Thomson cabinet label].
Identity. ? *Rhembobius nigricollis* (Thomson).

Adelognathus (Adelognathus) aciculatus, 1883: 879. Type(s) ♀, SWEDEN: Skåne, Stehag (lost).
Identity. *Adelognathus aciculatus* Thomson.

Adelognathus (Adelognathus) dimidiatus, 1888*b*: 1276. Lectotype ♀, FRANCE: Raismes (UZI, Lund), by designation of Aubert, 1972: 147.
Labels. Raismes. [hand]; dimidiatus [hand].
Identity. *Adelognathus dimidiatus* Thomson.

Adelognathus (Adelognathus) facialis, 1883: 880. Holotype ♀, SWEDEN: Norrland (UZI, Lund).
Labels. Norl. [printed]; facialis [Thomson cabinet label].
Identity. *Adelognathus facialis* Thomson.

Adelognathus (Adelognathus) fasciatus, 1883: 878. Holotype ♀, SWEDEN: Skåne, Söfdeborg [= Sövdeborg] (UZI, Lund).
Label. Sbg 23/7 [hand].
Identity. *Adelognathus fasciatus* Thomson.

Adelognathus (Adelognathus) laevicollis, 1883: 878. Syntypes 4 ♀, 1 ♂, SWEDEN: Skåne, Ringsiön [= Ringsjön] (UZI, Lund).
Labels. Rsiö [printed] (2♀). Scan [printed] (1♀). [small green square]; laevicollis [Thomson cabinet label] (1 ♀). [small green square]; ♂ [printed] (1 ♂).
Identity. *Adelognathus laevicollis* Thomson.

Adelognathus (Adelognathus) limbatus, 1888*b*: 1275. LECTOTYPE ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), here designated (selected by J. F. Aubert).
Label. Pål [hand].
Identity. Junior synonym of *Adelognathus brevicornis* Holmgren (Perkins, 1943*b*: 95, 104).

Adelognathus (Adelognathus) nigriceps, 1888*b*: 1274. Type(s) ♀, FRANCE (lost).
From the description it seems likely that there was only one specimen, which may have been returned to Lethierry. There are no specimens under this name in the Thomson collection.
Identity. *Adelognathus nigriceps* Thomson (Perkins, 1943*b*: 99).

Adelognathus (Adelognathus) nigricornis, 1888*b*: 1276. Type(s) ♀, FRANCE (lost).
The comments on *A. nigriceps* apply to this species also.
Identity. *Adelognathus nigricornis* Thomson (Perkins, 1943*b*: 100).

Adelognathus (Cnemischus) pilosus, 1888*b*: 1277. Holotype ♀, SWEDEN: Skåne, Alnarp (UZI, Lund).
Labels. Alnarp [printed]; pilosus [Thomson cabinet label].
Identity. *Adelognathus pilosus* Thomson.

Adelognathus (Adelognathus) puncticollis, 1883: 877. Holotype ♀, SWEDEN: Småland (UZI, Lund).
Labels. Smol [printed]; puncticollis [Thomson cabinet label].
Identity. *Adelognathus puncticollis* Thomson.

Adelognathus (Adelognathus) punctiventris, 1883: 877. Lectotype ♀, SWEDEN: Skåne, Torekov (UZI, Lund), by designation of Jussila, 1965: 31.
Label. Tkov 23/7 [hand] [not 'Tkro' as stated by Jussila].
Identity. *Adelognathus punctiventris* Thomson.

Adelognathus (Adelognathus) punctulatus, 1883: 879. Syntype 1 ♀, SWEDEN: Skåne, Ringsiön [= Ringsjön] (UZI, Lund).
Label. Rsiö [printed].
Identity. *Adelognathus punctulatus* Thomson.

Adelognathus (Adelognathus) scabriculus, 1883: 877. Lectotype ♀, SWEDEN: Lappland (UZI, Lund), by designation of Jussila, 1965: 30.
Label. Lpl. [printed].
Identity. Junior synonym of *Adelognathus tetracinctorius* (Thunberg) (Jussila, 1965: 30).

Aethecerus graniger, 1891: 1641. Syntype 1 ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund).
Label. [small green square].
The head is missing from the syntype ♀.
Identity. *Aethecerus graniger* Thomson.

Aethecerus pallicoxa, 1891: 1640. Syntypes 4 ♀, 8 ♂, SWEDEN: Skåne (UZI, Lund).
Labels. Hbg [hand]; pallicoxa [Thomson cabinet label] (1 ♀, 2 ♂ all on one pin). Pål [hand] (3 ♀, 6 ♂).
The pin bearing three specimens also bears Aubert's lectotype label but without any indication of the specimen to which it applies.
Identity. *Aethecerus pallicoxa* Thomson.

Allomacrus pimplarius, 1888*b*: 1282. LECTOTYPE ♀, SWEDEN: Skåne, Esperöd [= Äsperöd] (UZI, Lund), here designated (selected by H. K. Townes).
Label. Esp [printed].
Identity. *Allomacrus pimplarius* Thomson.

Amblyteles (Amblyteles) anurus, 1888*a*: 114. Syntypes ♀ ♂, SWEDEN (lost).
There are no specimens under this name in the Thomson collection.
Identity. Unknown, the name remains a *nomen dubium*.

Amblyteles (Ctenichneumon) circulator, 1894: 2085. Syntypes 1 ♀, 1 ♂, SWEDEN: *vid* Göteborg (♀) and *på* Gottland (♂) (UZI, Lund).
Labels. Boh. Skärg [printed] [= Bohuslän skärgård, islands off the coast at Göteborg]; Circulator m [Thomson cabinet label] (♀). G [hand] (♂).
Identity. *Ctenichneumon circulator* (Thomson).

Amblyteles (Amblyteles) limnophilus, 1888*a*: 119. Syntypes 3 ♀, 4 ♂, SWEDEN (UZI, Lund).
Labels. L-d [printed] (1 ♀). Yddinge [printed]; limnophilus [hand]; Ammonius [Thomson cabinet label] (1 ♀). Ringsiö [printed] (1 ♂). Col. Hgn. [printed] [= Col. Holmgren] (1 ♂). [No labels] (1 ♀, 2 ♂).
With the original description Thomson merely cited the locality as 'Suecia'. Later (1894: 2089) he commented 'Sällsynt på fuktiga ställen'. In view of this, it is almost certain that not all of the 38 specimens standing in the collection are syntypes. The few specimens which best agree with the description have been labelled as syntypes.
Identity. *Spilichneumon limnophilus* (Thomson) **comb. n.**

Amblyteles (Amblyteles) longigena, 1888*a*: 112. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 491.
Label. Pålsiö [printed].
Identity. *Diphyus longigena* (Thomson).

Amblyteles (Platylabus) opaculus, 1888*a*: 124. Syntypes 3 ♀, 2 ♂, SWEDEN: Skåne, Pålsjö and Alnarp (UZI, Lund).
Labels. Pål [hand] (3 ♀, 1 ♂). Alp. [hand] (1 ♂).
Although Thomson only gave 'Suecia' as the locality in the original description, he later (1894: 2108) gave more precise information: 'vid Pålsjö och Alnarp i Skåne'. Three further specimens are from other localities and were, therefore, probably added to the collection after 1894 and unlikely to be syntypes.
Identity. *Platylabus opaculus* (Thomson).

Amblyteles (Anisobas) parviceps, 1888*a*: 122. Syntype 1 ♀, SWEDEN: Skåne, Lund (UZI, Lund).
Labels. Lund [printed]; parviceps [hand]; sublaevis [Thomson cabinet label].
The syntype stands in the collection under '? hostilis'. Thomson may have had only one original specimen (holotype). In his later treatment of *Anisobas* (1894: 2099) he does not mention *parviceps* but gives characters of both sexes under *hostilis*. The label 'Lund', present when I first examined the specimen in 1978, was missing when I re-examined it in 1980.
Identity. *Anisobas parviceps* (Thomson).

Amblyteles (Anisobas) platystylus, 1888*a*: 122. Lectotype ♂, SWEDEN: Skåne, Rössjöholm (UZI, Lund), by designation of Aubert, 1966: 128.
Label. Rshm 16/6 [hand].
Thomson (1894: 2099) referred to the species as *Anisobas platylabus* (incorrect subsequent spelling), the name also used by Aubert when designating the lectotype. The locality label was wrongly interpreted by Aubert as Råby.
Identity. *Anisobas platystylus* (Thomson).

Amblyteles (Platylabus) punctifrons, 1888*a*: 124. Syntypes 2 ♀, ? syntypes 2 ♀, Sweden (UZI, Lund).

Labels. Scan [printed] (syntype). Sk. [hand]; punctifrons m [hand] (syntype). 12 [+ two words (illegible)] (? syntype). I. antennator ♀ [hand] (? syntype).

Thomson only gave 'Suecia' as the locality in the original description. Later (1894: 2108) he stated 'Funnen i Skåne vid Esperöd.' The labels of the specimens labelled as syntypes or possible syntypes do not bear any data which conflict with this locality information. Further specimens are from Ringsjön and, therefore, probably post-date the 1894 publication and unlikely to be syntypes. The specimen with Thomson's label 'punctifrons m' has the apex of the gaster missing.

Identity. *Platylabus punctifrons* (Thomson).

Amblyteles (Amblyteles) simplicidens, 1888*a*: 120. Holotype ♀, Sweden: Skåne, Stehag (UZI, Lund).

Labels. Ste CM [hand] [CM = Carl Möller]; simplicidens [hand]; simplicidens [Thomson cabinet label].

Thomson's original description did not include any characters of the male and the single female specimen is presumed to be a holotype. Thomson later (1894: 2090) gave characters of both sexes and the locality Ringsjön. It is assumed that the three male specimens in the collection post-date the original description. One of these males is of particular interest because its pin bears both a green square (of the paler, brighter kind) and a printed label 'Ringsiö', further evidence that the green squares mean that the specimens with them were collected in the vicinity of Ringsjön.

Identity. *Spilichneumon simplicidens* (Thomson).

Amblyteles (Amblyteles) stagnicola, 1888*a*: 119. Lectotype ♀, Sweden: Småland (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 505.

Labels. Smoland [printed]; stagnicola [hand]; laeviventris [Thomson cabinet label].

Thomson gave only 'Suecia australis' as the locality in the original description but later (1894: 2089–2090) he stated 'Funnen vid Båstad och Ringsjön i Skåne'. Although the locality of the lectotype is not in agreement with this later information there is nothing *positive* to invalidate its selection as lectotype. However, in cases of this kind it is prudent to recognise as syntypes (and select lectotypes from) material from the localities mentioned by Thomson. Material from other localities probably post-dates the later publication and is therefore unlikely to include syntypes.

Identity. *Spilichneumon stagnicola* (Thomson).

Amblyteles (Spilichneumon) triplicatus, 1894: 2088. Syntypes 2 ♀, 2 ♂, Sweden: Stockholm and Halland (UZI, Lund).

Labels. 106. [hand]; Stkm. [hand]; Amb. 7-guttatus [hand]; 3-plicatus m [Thomson cabinet label] (1 ♀). Holm [printed] [= Holmia]; Hallstr. [hand] (1 ♀). Halland [hand]; Rui [hand] (2 ♂).

Identity. *Diphyus triplicatus* (Thomson) **comb. n.**

Amblyteles (Amblyteles) truncicola, 1888*a*: 115. LECTOTYPE ♀, Sweden: Skåne, Lund (UZI, Lund), here designated (selected by J. F. Aubert).

Labels. Lund [printed]; ♀ [printed]; truncicola [Thomson cabinet label].

Thomson gave only Suecia as the locality in the original description but later (1894: 2092) stated 'funnen vid Lund'.

Identity. *Spilothyrateles truncicola* (Thomson) **comb. n.**

Angitia annulicrus, 1887*c*: 1155. Lectotype ♀, Sweden: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1966: 130.

Labels. Pål [hand]; ♀ [printed]; annulicrus [Thomson cabinet label].

Identity. *Diadegma annulicrus* (Thomson).

Angitia anura, 1887*c*: 1164. Syntypes 1 ♀, Sweden: Gottland [= Gotland] (UZI, Lund); 1 ♀, ? Germany (ZSBS, Munich).

Labels. G [hand]; anura [Thomson cabinet label] (Lund specimen). 56. 2. [hand]; 40. anura Thms. [hand] (Munich specimen).

Aubert (1972: 150) was incorrect in referring to the Lund specimen as 'holotype'. Thomson gives clear evidence of a syntype series. The Munich specimen (from the Kriechbaumer collection) is accompanied by two cocoons (each labelled '56. 2.' and on separate pins).

Identity. *Diadegma anura* (Thomson).

Angitia brevivalvis, 1887*c*: 1163. Lectotype ♀, Sweden: Skåne, Ringsiön [= Ringsjön] (UZI, Lund), by designation of Horstmann, 1969: 436.

Labels. Rsiö [printed]; brevivalvis [Thomson cabinet label].

Identity. *Diadegma brevivalvis* (Thomson).

Angitia claripennis, 1887*c*: 1161. Lectotype ♂, SWEDEN: Skåne, Båstad (UZI, Lund), by designation of Aubert, 1966: 130.

Label. Båst [hand].

Identity. Junior synonym of *Diadegma majalis* (Gravenhorst) (Horstmann, 1969: 461).

Angitia crassiseta, 1887*c*: 1162. Type(s) ♀, SWEDEN: Skåne, Lund (lost).

NEOTYPE ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), here designated (selected by J. F. Aubert, 1966: 130).

Aubert's original publication of the neotype (1966: 130) was not valid because it did not comply with the provisions of Article 75(c) of the *Code*. Horstmann (1969: 457) cited the neotype and gave characters to differentiate the species, but otherwise did not satisfy the conditions of Article 75(c).

Thomson's original material of this species cannot be found either in his main collection or among the duplicate material. It is therefore believed to be lost or destroyed. The neotype stands in Thomson's collection under the name *Angitia crassiseta* and is in agreement with the original description.

Labels. Rsiö [printed]; crassiseta [Thomson cabinet label].

Identity. Diadegma crassiseta (Thomson).

Angitia crataegellae, 1887*c*: 1164. Lectotype ♂, GERMANY (WEST): Bavaria (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 293.

Labels. 5650 [yellow, hand]; Germ. [hand]; Crataegellae [Thomson cabinet label].

Identity. Probable junior synonym of *Enytus apostatus* (Gravenhorst) (Horstmann, 1969: 441). Horstmann (1969) regards *Dioctes* (= *Enytus*) as a junior synonym of *Diadegma* and not as a distinct genus (Townes, 1970*b*: 177).

Angitia elongata, 1887*c*: 1155. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Horstmann, 1969: 429.

Labels. Pål [hand]; elongata [Thomson cabinet label].

Identity. Diadegma elongata (Thomson).

Angitia holopyga, 1887*c*: 1160. LECTOTYPE ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), here designated (selected by Aubert and Horstmann).

Aubert's published lectotype designation (1966: 130) and Horstmann's citation of the lectotype (1969: 436) are invalid because there are two females on the pin bearing Aubert's label (dated 1963 and not indicating which specimen is lectotype). Aubert (1966) stated 'No. 1' ['indiqué le numéro d'ordre de l'Insecte dans la série originale'] but it is impossible to decide whether the upper or lower specimen is the first in the series. The pin also bears Horstmann's label 'Lektotypus das untere ♀ Horstm. det. 1970' which postdates his publication on this species. The lower of the two specimens is here designated lectotype.

Labels. Örtofta [printed]; holopyga [Thomson cabinet label].

Identity. Diadegma holopyga (Thomson).

Angitia lacticrus, 1887*c*: 1163. Lectotype ♀, SWEDEN: Skåne, Ringsiön [= Ringsjön] (UZI, Lund), by designation of Horstmann, 1969: 443.

Labels. [small green square]; lacticrus [Thomson cabinet label].

Identity. Diadegma lacticrus (Thomson).

Angitia latungula, 1887*c*: 1165. Lectotype ♀, FRANCE (UZI, Lund), by designation of Horstmann, 1969: 442.

Label. Gall [hand] [= Gallia].

Identity. Diadegma latungula (Thomson).

Angitia macrostoma, 1887*c*: 1166. Holotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund).

Labels. Ört [hand]; macrostoma [Thomson cabinet label].

Identity. Lathrostizus macrostoma (Thomson).

Angitia melania, 1887*c*: 1160. Lectotype ♀, SWEDEN: Skåne, Yddinge (UZI, Lund), by designation of Horstmann, 1969: 438.

Labels. Yd. [hand]; melania [Thomson cabinet label].

Identity. Diadegma melania (Thomson).

Angitia micrura, 1887*c*: 1164. Syntypes 2 ♀, 2 ♂, SWEDEN: Skåne, Pålsjö and FRANCE: Emmerin and Scarpe (UZI, Lund).

Labels. Pål. [hand]; Var [printed] (1 ♀). Emmerin. [hand]; ♀ [printed] (1 ♀). Emmerin. [hand] (1 ♂). Scarpe [hand]; micrura [Thomson cabinet label] (1 ♂).

The male specimen published by Aubert (1966: 131) as lectotype is from Örtofta [label: 'Ört'] not Pålsjö as stated by Aubert. It has no type status.

Identity. Diadegma micrura (Thomson).

Angitia monilicornis, 1887*c*: 1167. Lectotype ♀, Sweden: Lappland (UZI, Lund), by designation of Horstmann, 1969: 446.

Labels. Lpl. [printed]; crassinervis [hand]; monilicornis [Thomson cabinet label].

Identity. Lathrostizus monilicornis (Thomson).

Angitia monospila, 1887*c*: 1157. Lectotype ♀, Sweden: Skåne, Båstad (UZI, Lund), by designation of Aubert, 1966: 131.

Labels. Båst [hand]; monospila [Thomson cabinet label].

Although Townes, Momoi & Townes (1965: 297) were almost certainly correct in recognising this as the type (= holotype, the single original specimen) Aubert chose to designate it as lectotype. He presented no evidence of a syntype series.

Identity. Diadegma monospila (Thomson).

Angitia parvicanda, 1887*c*: 1163. Lectotype ♀, Sweden: Skåne, Pålsjö (UZI, Lund), by designation of Horstmann, 1969: 437.

Labels. Pål. [hand]; Var [printed]; parvicauda [Thomson cabinet label].

Authors since Thomson (for example, Dalla Torre, 1901: 130; Horstmann, 1969: 437) have chosen to alter the spelling of the name to *parvicauda* and there is evidence (Thomson's own cabinet label) that this is what was intended. However, a strict interpretation of Article 32(a)(ii) of the *Code* (as amended, *Bull. zool. Nom.* **31** (1974): 83) suggests that the original spelling should be retained.

Identity. Diadegma parvicanda (Thomson).

Angitia polyzona, 1887*c*: 1159. Lectotype ♀, France: Marseille (UZI, Lund), by designation of Aubert, 1966: 131.

Labels. Marseille [hand]; polyzona [Thomson cabinet label].

Identity. Junior synonym of *Diadegma maculata* (Gravenhorst) (Horstmann, 1969: 454).

Angitia punctipes, 1887*c*: 1166. Lectotype ♀, Sweden: Skåne, Pålsjö (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 303.

Labels. Pål. [hand]; punctipes [Thomson cabinet label].

Identity. Lathrostizus punctipes (Thomson).

Angitia rimator, 1887*c*: 1156. Syntype 1 ♀, Sweden: Skåne, Torekov (UZI, Lund).

Label. Sk [hand].

The specimen published by Aubert (1966: 131) as lectotype, and cited by Horstmann (1969: 459), is from Lomma [label: 'Lom̃a 20/7'] not Torekov as stated by Aubert. It has no type status.

Identity. Diadegma rimator (Thomson).

Angitia sordipes, 1887*c*: 1156. Lectotype ♀, Sweden: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1966: 131.

Labels. Pål. [hand]; sordipes [Thomson cabinet label].

Identity. Diadegma sordipes (Thomson).

Angitia specularis, 1887*c*: 1162. Lectotype ♀, Sweden: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1966: 131.

Label. Pål [hand].

Although Townes, Momoi & Townes (1965: 298) were almost certainly correct in recognising this as the type (= holotype, the single original specimen) Aubert chose to designate it as lectotype. He presented no evidence of a syntype series.

Identity. Diadegma specularis (Thomson).

Angitia subbuccata, 1887*c*: 1156. Lectotype ♀, Sweden: Skåne, Lund (UZI, Lund), by designation of Aubert, 1966: 131.

Label. L-d [printed].

The lectotype is the upper of three specimens on one pin. The middle specimen has the gaster missing and the lower one is a male.

Identity. Junior synonym of *Diadegma truncata* (Thomson) (Horstmann, 1969: 459).

Angitia tenuipes, 1887*c*: 1158. Lectotype ♀, Sweden: Skåne, Lund (UZI, Lund), by designation of Aubert, 1966: 131.

Labels. Ld [hand]; tenuipes [Thomson cabinet label].

Aubert (1966: 131) cited the locality, incorrectly, as Örtofta.

Identity. Diadegma tenuipes (Thomson).

Angitia trochanterata, 1887*c*: 1157. Lectotype ♀, SWEDEN: Skåne, Degeberga (UZI, Lund), by designation of Aubert, 1966: 131.
Label. Dgb. [hand].
Identity. Diadegma trochanterata (Thomson).

Angitia truncata, 1887*c*: 1155. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1966: 131.
Labels. Pål [hand]; truncata [Thomson cabinet label].
Identity. Diadegma truncata (Thomson).

Anilasta albicrus, 1887*c*: 1171. Lectotype ♀, GERMANY (WEST): Munich (UZI, Lund), by designation of Aubert, 1972: 150.
Labels. 63.3. [hand]; Germ [hand]; albicrus [Thomson cabinet label].
Identity. Junior synonym of *Hyposoter vividus* (Holmgren) (Aubert, 1972: 150, 151).

Anilasta boops, 1887*c*: 1173. Lectotype ♀, FRANCE: near Lille, Emmerin (UZI, Lund), by designation of Aubert, 1972: 150.
Labels. Emmerin [hand]; ♀ [printed].
Identity. Hyposoter boops (Thomson).

Anilasta coxator, 1887*c*: 1173. Syntypes 2 ♀, SWEDEN: Skåne, Ringsiön [= Ringsjön] and GERMANY (WEST): Munich (UZI, Lund).
Labels. [small green square]; 3 [hand]; Coxator [Thomson cabinet label] (1 ♀). 75.528. [hand]; Germ. [hand] (1 ♀).
Identity. Hyposoter coxator (Thomson) **comb. n.**

Anilasta facialis, 1887*c*: 1174. Lectotype ♀, FRANCE (UZI, Lund), by designation of Aubert, 1972: 150.
Label. Gallia [hand].
Identity. Hyposoter facialis (Thomson).

Anilasta leucomera, 1887*c*: 1172. Lectotype ♀, SWEDEN: Skåne, Yddinge (UZI, Lund), by designation of Aubert, 1966: 131.
Label. Yddinge [printed].
Identity. Hyposoter leucomerus (Thomson).

Anilasta longula, 1887*c*: 1171. LECTOTYPE ♀, SWEDEN: Skåne, Ryssjöholm [= Rössjöholm] (UZI, Lund), here designated (selected by R. Hinz).
Labels. Rshm 16/6 [hand]; longula [hand]; longula [Thomson cabinet label].
Identity. Hyposoter longulus (Thomson) **comb. n.**

Anilasta pectinata, 1887*c*: 1171. Lectotype ♀, SWEDEN: Skåne, Esperöd [= Äsperöd] (UZI, Lund), by designation of Aubert, 1972: 151.
Label. Scan [hand].
Identity. Hyposoter pectinatus (Thomson).

Anilasta picticollis, 1887*c*: 1174. ?Holotype ♀, ?ITALY (UZI, Lund).
Labels. +125 [hand]; Dalm. [printed] [= Dalmatia]; picticollis [Thomson cabinet label].
Thomson gave the locality for his single specimen as 'norra Italien'. Because the specimen is labelled 'Dalm.' there must be doubt about its status or the type-locality or both.
Identity. Hyposoter picticollis (Thomson).

Anilasta quadrinotata [as *4-notata*], 1887*c*: 1174. Lectotype ♀, FRANCE: Ostricourt (UZI, Lund), by designation of Aubert, 1972: 151.
Label. Ostricourt. [hand].
Ostricourt is near Phalempin (south of Lille).
Identity. Echthronomas quadrinotata (Thomson).

Anilasta ruficrus, 1887*c*: 1172. Lectotype ♀, SWEDEN: Skåne, Helsingborg (UZI, Lund), by designation of Aubert, 1966: 131.
Labels. Hbg. [hand]; ruficrus [Thomson cabinet label].
Identity. Hyposoter ruficrus (Thomson).

Anilasta tenuicosta, 1887*c*: 1170. Lectotype ♂, SWEDEN: Norrland (UZI, Lund), by designation of Aubert, 1972: 151.
Labels. Norl. [printed]; tenuicosta [Thomson cabinet label].
Identity. Hyposoter tenuicosta (Thomson).

Anilasta varicoxa, 1887*c*: 1173. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1972: 151.

Labels. Pål [hand]; varicoxa [Thomson cabinet label].

Identity. Junior synonym of *Hyposoter neglectus* (Holmgren) (Aubert, 1972: 151).

Anomalon (Anomalon) annulitarse, 1892*a*: 1764. Syntypes ♀♂, SWEDEN and GERMANY (lost).

The syntype series of this species comprises the specimens in Thomson's own collection (from 'mellersta Sverige') together with the specimens (from Germany and Sweden) which were the bases of the descriptions of Gravenhorst and Holmgren to which Thomson refers. All of the syntypes are lost.

The seven specimens in Thomson's collection are from Germany (label 'Germ.') and France (label 'Gall.') and therefore cannot be his syntypes. One of them has been labelled incorrectly as 'lectotype'. The part of the Gravenhorst collection including *Anomalon fibulator* is lost (Townes, 1959: 77). The collections of the Naturhistoriska Riksmuseum, Stockholm include only two specimens referable to *Anomalon fibulator* sensu Holmgren. These do not correspond to Holmgren's 'Var. 1' and are therefore not syntypes of Thomson's species.

Identity. Junior synonym of *Gravenhorstia* (*Erigorgus*) *fibulator* (Gravenhorst) (det. I. D. Gauld).

Anomalon (Anomalon) claripennis, 1892*a*: 1764. Lectotype ♂, SWEDEN: Östergötland (UZI, Lund), by designation of Aubert, 1966: 130.

Labels. O Got [printed]; Col. Hgn. [printed]; claripenne m [Thomson cabinet label].

Aubert (1966: 130) cited the locality, incorrectly, as Gotland.

Identity. *Gravenhorstia* (*Erigorgus*) *claripennis* (Thomson) (det. I. D. Gauld).

Anomalon (Barylypa) genalis, 1892*a*: 1767. LECTOTYPE ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), here designated (selected by H. K. Townes).

Labels. [green square]; genalis [hand]; genalis m. [Thomson cabinet label].

Identity. Junior synonym of *Barylypa delictor* (Thunberg) (det. I. D. Gauld).

Anomalon (Anomalon) lapponicum, 1892*a*: 1763. Holotype ♀, SWEDEN: Lappland (UZI, Lund).

Labels. Lap [hand]; Lapponicum m. [Thomson cabinet label].

Identity. Junior synonym of *Gravenhorstia* (*Erigorgus*) *cerinops* (Gravenhorst) (det. I. D. Gauld).

Anomalon (Barylypa) laticeps, 1892*a*: 1766. Lectotype ♂, SWEDEN: Öland (UZI, Lund), by designation of Viktorov & Athanasov, 1974: 376.

Labels. Ö [hand]; laticeps n. [Thomson cabinet label].

Identity. Junior synonym of *Barylypa pallida* (Gravenhorst) (det. I. D. Gauld).

Anomalon (Anomalon) orbitale, 1892*a*: 1764. Holotype ♀, SWEDEN: Skåne, Lund (UZI, Lund).

Labels. [red square] [= Lund, Zetterstedt collection]; O. vagator ? Zett. ♀. ex duf [illegible] 15 Mars 1869 [hand]; orbitale m [Thomson cabinet label].

Identity. *Gravenhorstia* (*Erigorgus*) *orbitale* (Thomson) (det. I. D. Gauld).

Anomalon (Exochilum) pyramidatus, 1894: 2118. Holotype ♂, SWEDEN: Östergöthland [= Östergötland] (UZI, Lund).

Labels. O Got [printed]; Goës [hand]; pyramidatus m. [Thomson cabinet label].

Identity. Junior synonym of *Therion giganteum* (Gravenhorst) (det. I. D. Gauld).

Anomalon (Agrypon) rugifer, 1894: 2119. LECTOTYPE ♀, SWEDEN: Östergöthland [= Östergötland] (UZI, Lund), here designated (selected by G. A. Viktorov).

Labels. O Got [printed]; rugifer m [Thomson cabinet label].

Identity. *Agrypon rugifer* (Thomson) (det. I. D. Gauld).

Anomalon (Agrypon) stenostigma, 1892*a*: 1771. Lectotype ♂, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 378.

Label. Pål [hand].

Identity. *Agrypon stenostigma* (Thomson) (det. I. D. Gauld).

Anomalon (Anomalon) varicorne, 1894: 2119. LECTOTYPE ♀, SWEDEN: Norrland (UZI, Lund), here designated (selected by H. Schnee).

Labels. [Grey-green diamond]; varicorne m [Thomson cabinet label].

Identity. *Gravenhorstia* (*Erigorgus*) *varicorne* (Thomson) (det. I. D. Gauld).

Asthenarus crassifemur, 1889: 1437. LECTOTYPE ♀, SWEDEN: Skåne, Vestra Wram [= Västra Vram] (UZI, Lund), here designated (selected by H. K. Townes).

Labels. V. W. [hand]; crassifemur [Thomson cabinet label].

Identity. *Asthenara crassifemur* (Thomson).

Atractodes (Polyrhembia) alutaceus, 1884: 1026. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Jussila, 1979: 40.
Labels. L-d [printed]; ♀ [printed].
Identity. Atractodes alutaceus Thomson.

Atractodes (Atractodes) breviscapus, 1884: 1023. Lectotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Jussila, 1979: 19.
Labels. Ört [hand]; ♀ [printed].
Jussila (1979: 19) incorrectly cites the type-locality as Östergötland. Also, Horstmann's label is dated 1965 not 1956.
Identity. Junior synonym of *Atractodes pauxillus* Foerster (Jussila, 1979: 19).

Atractodes (Atractodes) compressus, 1884: 1023. Lectotype ♀, SWEDEN: Halland (UZI, Lund), by designation of Jussila, 1979: 38.
Labels. Halland [printed]; compressus [Thomson cabinet label].
Identity. Junior synonym of *Atractodes croceicornis* Haliday (Jussila, 1979: 37–38).

Atractodes (Atractodes) crassicornis, 1884: 1025. Syntype 1 ♀, SWEDEN: Skåne, Lund (UZI, Lund).
Label. Lund [printed].
The specimen labelled and published by Jussila (1979: 21) as lectotype is from 'Pålsiö' and therefore cannot have been a syntype. It has no type status.
Identity. Atractodes crassicornis Thomson, ? junior synonym of *Atractodes intersectus* Foerster.

Atractodes (Exolytus) filicornis, 1884: 1020. Syntypes ♀ ♂, SWEDEN: Skåne, Bökeberg (lost).
Identity. Mesoleptus filicornis (Thomson) (based on material in the collection).

Atractodes (Atractodes) flavicoxa, 1884: 1024. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Jussila, 1979: 28.
Label. L-d [printed].
Identity. Junior synonym of *Atractodes angustipennis* Foerster (Jussila, 1979: 28).

Atractodes (Exolytus) flavipes, 1884: 1021. Syntypes 1 ♀, 6 ♂, SWEDEN: Skåne, Pålsiö [= Pålsjö] (UZI, Lund).
Labels. Pål [hand] (1 ♀ 4 ♂). Pålsiö [printed] (1 ♂). Pål [hand]; flavipes [Thomson cabinet label] (1 ♂).
Identity. Mesoleptus flavipes (Thomson) **comb. n.**

Atractodes (Atractodes) liogaster, 1884: 1023. Lectotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Aubert, 1966: 129.
Label. Örtofta [printed].
Identity. Junior synonym of *Atractodes pusillus* Foerster (Jussila, 1979: 19).

Atractodes (Exolytus) marginatus, 1884: 1020. Lectotype ♀, SWEDEN: Göteborg (UZI, Lund), by designation of Aubert, 1966: 130.
Labels. Suecia [printed]; marginatus [Thomson cabinet label].
Identity. Mesoleptus marginatus (Thomson).

Atractodes (Atractodes) parallelus, 1884: 1024. Lectotype ♂ [not ♀ as stated by Jussila, 1979: 39], SWEDEN: Skåne, Båstad (UZI, Lund), by designation of Jussila, 1979: 39.
Label. Båstad [printed].
Identity. Junior synonym of *Atractodes eryptobius* Foerster (Jussila, 1979: 39).

Atractodes (Exolytus) petiolaris, 1884: 1020. Lectotype ♀, SWEDEN: Skåne, Råby near Lund (UZI, Lund), by designation of Aubert, 1966: 130.
Labels. Råb 1/7 [hand]; petiolaris [Thomson cabinet label].
Identity. Mesoleptus petiolaris (Thomson).

Atractodes (Exolytus) ripicola, 1884: 1021. Lectotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 149.
Label. Örtofta [printed].
Identity. Mesoleptus ripicola (Thomson).

Atractodes (Asyncrita) rufipes, 1884: 1025. Holotype ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund).
Labels. Sk. [hand]; rufipes [Thomson cabinet label].
Identity. Junior primary homonym of *Atractodes rufipes* Provancher, 1874: 151 and of *Atractodes rufipes* Foerster, 1876: 151 [not 135 as stated by Jussila, 1979: 21] and junior secondary homonym of

Atractodes rufipes (Foerster, 1876: 30 (*Asyncrita*)). Replacement name *Atractodes thomsoni* (Dalla Torre, 1902: 739 (*Asyncrita*)) **comb. n.** The replacement name is itself a secondary homonym of *Atractodes thomsonii* Dalla Torre, 1902: 725. However, these latter two names were published simultaneously and, acting as first reviser (Article 24(a) of the *Code*), I hereby reject *Atractodes thomsonii* Dalla Torre, 1902: 725 as the junior name.

Unfortunately, the above names were not taken into account by Jussila (1979) in his revision of western Palaearctic *Atractodes* and as a result *Atractodes thomsoni* Jussila, 1979: 14 and *Atractodes rufipes* (Foerster, 1876: 30 [not 14 as stated by Jussila, 1979: 31]) are junior primary and secondary homonyms respectively, and need replacement names. Replacement names are not here proposed but the problems have been drawn to the attention of Jussila.

Atractodes (Atractodes) tenuipes, 1884: 1022. Holotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund).
Labels. Ört. [hand]; tenuipes [Thomson cabinet label].
Identity. *Atractodes tenuipes* Thomson.

Baeosomus oenescens, 1891: 1615. Syntype 1 ♀, FRANCE: Furca (UZI, Lund).
Labels. Furca [hand]; oenescens m [Thomson cabinet label].

It is not clear whether the male mentioned by Thomson (which is in the Kriechbaumer collection, ZSBS, Munich) should be considered a syntype or excluded from the type-series under Article 72(b) of the *Code*.

Some authors (for example, Dalla Torre, 1902: 753) have unjustifiably emended the name to *aenescens*.
Identity. *Baeosemus oenescens* (Thomson).

Banchus femoralis, 1897: 2411. Lectotype ♀, SWEDEN: Skåne (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 237.
Label. Scania [printed].
Identity. Junior synonym of *Banchus hastator* (Fabricius).

Bassus deletus, 1890: 1466, 1471. LECTOTYPE ♀, SWEDEN: Lappland (UZI, Lund), here designated (selected by K. Horstmann).
Label. Lpl [printed].
Identity. *Diplazon deletus* (Thomson).

Bassus varicoxa, 1890: 1466, 1468. Holotype ♀, SWEDEN: Norrland (UZI, Lund).
Labels. Norl. [printed]; varicoxa n. [Thomson cabinet label].
Identity. *Diplazon varicoxa* (Thomson).

Blapticus (Blapticus) crassulus, 1888*b*: 1289. Lectotype ♂, SWEDEN: Skåne, Yddingesjön (UZI, Lund), by designation of Aubert, 1972: 147–148.
Label. Yddinge [printed].
Identity. *Blapticus crassulus* Thomson.

Blapticus (Blapticus) dentifer, 1888*b*: 1288. LECTOTYPE ♂, SWEDEN: Skåne, Pålsjö (UZI, Lund), here designated (selected by H. K. Townes).
Label. Pål. [hand].
Identity. *Blapticus dentifer* Thomson.

Brachycryptus erythrocerus, 1873: 488. Lectotype ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), by designation of Townes & Townes, 1962: 319.
Label. Ringsiö [printed].
Identity. Junior synonym of *Hidryta frater* (Cresson) (Townes & Townes, 1962: 319).

Brachycryptus fusiventris, 1873: 489. Syntype 1 ♀, DENMARK: Jutland, Horsens (ZM, Copenhagen).
Labels. ♀ 23/7 1870 Horsens O. Jensen [hand]; Danmark ex coll. Schiødte [printed].
Identity. *Hidryta fusiventris* (Thomson).

Brachycryptus sordidulus, 1873: 488. Syntypes 2 ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund).
Labels. [small green square] (2 ♀).
Identity. *Hidryta sordidula* (Thomson).

Cacotropa sericea, 1888*b*: 1259. Syntype 1 ♀, ? syntype 1 ♀, SWITZERLAND: Biel and ? SWEDEN: Östergöthland [= Östergötland] (UZI, Lund).
Labels. 17.v.85/Biel [printed, date hand]; 3235 [printed]; sericea [hand] (syntype). OG [hand, illegible and possibly not 'OG']; Sp. ign. ♀. [hand]; Col Zet [printed] (? syntype).
Identity. Junior synonym of *Sphecophaga vesparum* (Curtis).

Caenocryptus apum, 1873: 497. Syntype 1 ♀, DENMARK: Zealand, Dyrehaven (ZM, Copenhagen).
Labels. ♀ Dyrehave Drewsen [hand]; Danmark ex coll. Schiødte [printed].
Identity. Xylophrurus apum (Thomson) **comb. n.**

Caenocryptus dentifer, 1896: 2362. Holotype ♀, SWEDEN: Stockholm (UZI, Lund).
Labels. Col. Hgn. [printed]; dentifer [hand].
Identity. Junior synonym of *Xylophrurus lancifer* (Gravenhorst) (Townes, Momoi & Townes, 1965: 202). [*Note. Xylophrurus dispar* (Thunberg (*Ichneumon*)) is a junior primary homonym of *Ichneumon dispar* Gmelin *in* Linnaeus.]

Caenocryptus inflatus, 1873: 497. Syntype 1 ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund).
Label. [small green square].
There are 3 ♀ in the Zoological Museum, Copenhagen which might also be syntypes, but although they are from the Drewsen collection they were not collected by Drewsen.
Identity. Enclisis inflatus (Thomson) **comb. n.**

Caenocryptus laticrus, 1896: 2362. Lectotype ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), by designation of Aubert, 1966: 128.
Label. Ringsiö [printed].
Identity. Enclisis laticrus (Thomson) **comb. n.**

Caenocryptus nubifer, 1896: 2361. Holotype ♀, SWEDEN: Vermland [= Värmland] (UZI, Lund).
Labels. Wml [printed]; nubifer [Thomson cabinet label].
Identity. Enclisis nubifer (Thomson) **comb. n.**

Caenocryptus pubiventris, 1873: 497. Syntypes 1 ♀, 1 ♂ (ZM, Copenhagen), 1 ♂ (UZI, Lund), DENMARK: Zealand, Strandmøllen.
Labels. ♀ 8/50 Strandmo'l Drewsen [hand]; Danmark ex coll. Schiødte [printed] (♀). ♂ Strandmo'l Drewsen [hand]; Danmark ex coll. Schiødte [printed] (Copenhagen ♂). pubiventris [Thomson cabinet label] (Lund ♂).
Identity. Enclisis pubiventris (Thomson) **comb. n.**

Caenocryptus striolatus, 1896: 2362. Syntype 1 ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund).
Labels. Scan sylv [printed]; striolatus [Thomson cabinet label].
Identity. Enclisis striolatus (Thomson) **comb. n.**

Caenocryptus tener, 1873: 496. Syntypes 1 ♀ (UZI, Lund), 29 ♀, 14 ♂ (ZM, Copenhagen), DENMARK: Zealand.
Labels. Dan [printed]; tener [Thomson cabinet label] (Lund ♀). Danmark ex coll. Schiødte [printed] (Copenhagen ♀♀ ♂♂).
The Copenhagen specimens are on pins identical to that of the Lund specimen and obviously from the same series. They stand with the labels 'Caenocryptus Thoms.' and 'Tener Thoms' under *Caenocryptus vindex* Tschek. Although it is not certain that Thomson saw all of the Copenhagen specimens it is perhaps desirable that a lectotype is selected from them since the Lund specimen has the gaster missing.
Identity. Enclisis tener (Thomson) **comb. n.**

Callidora annellata, 1887*c*: 1136. LECTOTYPE ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), here designated (selected by J. F. Aubert).
Labels. Hbg. [hand]; annellata [Thomson cabinet label].
Identity. Junior synonym of *Callidora albovincta* (Holmgren) (Townes, 1970*b*: 165).

Campoplex angustatus, 1887*c*: 1061. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1966: 130.
Label. Pål [hand].
Identity. Dusona angustata (Thomson).

Campoplex bifidus, 1887*c*: 1063. Holotype ♀, CZECHOSLOVAKIA: Bohemia, Chodau [= Chodov] (UZI, Lund).
Labels. 26/5 85 Ch [hand]; bifidus [Thomson cabinet label].
Identity. Dusona bifida (Thomson).

Campoplex castanipes, 1887*c*: 1063. Holotype ♀, CZECHOSLOVAKIA: Bohemia, Chodau [= Chodov] (UZI, Lund).
Labels. 9/6/76 Ch [hand]; castanipes [Thomson cabinet label].
Identity. Dusona castanipes (Thomson) **comb. n.**

Campoplex crassipes, 1887*c*: 1075. Lectotype ♀, GERMANY (WEST): Harz (UZI, Lund), by designation of Aubert, 1968: 195.

Labels. Harz [hand]; crassipes [Thomson cabinet label].

Although Hinz (1963: 339) was almost certainly correct in recognising this as 'Das typische ♀' (= holotype, the single original specimen) Aubert chose to designate it as lectotype. He presented no evidence of a syntype series.

Identity. Dusona crassipes (Thomson).

Campoplex flaviscapus, 1887*c*: 1061. Holotype ♂, FRANCE: Tias (UZI, Lund).

Labels. Tias [hand]; flaviscapus [Thomson cabinet label].

Identity. Dusona flaviscapus (Thomson).

Campoplex genalis, 1887*c*: 1070. Lectotype ♀, POLAND: Schlesien [= Silesia] (UZI, Lund), by designation of Aubert, 1968: 195.

Labels. 25 [hand]; Germ [hand]; genalis [Thomson cabinet label].

Although Hinz (1963: 337) was almost certainly correct in recognising this as 'Das typische ♀' (= holotype, the single original specimen) Aubert chose to designate it as lectotype. He presented no evidence of a syntype series.

Identity. Dusona genalis (Thomson).

Campoplex latungula, 1887*c*: 1065. Holotype ♀, U.S.S.R.: Tartu [not 'norra Tyskland' as stated by Thomson] (UZI, Lund).

Labels. 21/5 83 [hand]; Dorpat [hand]; latungula [Thomson cabinet label].

The specimen matches the description and is undoubtedly the holotype. The locality given by Thomson is obviously a mistake (which he also made in the case of *Megastylus pleuralis*).

Identity. Junior synonym of *Dusona polita* (Foerster) (Hinz, 1963: 338).

Campoplex limnobius, 1887*c*: 1088. Lectotype ♀, GERMANY (EAST): Schwerin (UZI, Lund), by designation of Hinz, 1963: 338.

Labels. Schwerin 7.85 [locality printed, date hand]; limnobius [Thomson cabinet label].

Identity. Dusona limnobia (Thomson).

Campoplex luteipes, 1887*c*: 1089. Holotype ♀, SWEDEN: Skåne, Ryssjöholm [= Rössjöholm] (UZI, Lund).

Labels. 81. [hand]; Rshm 16/6 [hand]; luteipes [Thomson cabinet label].

Identity. Dusona luteipes (Thomson).

Campoplex opacus, 1887*c*: 1074. Holotype ♀, GERMANY (WEST): Harz (UZI, Lund).

Labels. Harz [hand]; opacus [Thomson cabinet label].

Identity. Dusona opaca (Thomson).

Campoplex rectus, 1887*c*: 1086. Syntypes ♀, GERMANY (lost).

There are two specimens in the collection from Chodov (label 'Ch', see *Campoplex castanipes* above).

Identity. Dusona recta (Thomson) (on the basis of the material in the collection) **comb. n.**

Campoplex spinipes, 1887*c*: 1076. Lectotype ♀, GERMANY (EAST): Quedlingburg (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 289.

Labels. Quedlinburg [hand]; spinipes [Thomson cabinet label].

Identity. Dusona spinipes (Thomson).

Campoplex splendens, 1887*c*: 1064. Holotype ♀, SWEDEN: Skåne, Reften (UZI, Lund).

Labels. Reften 20/vi 82 [hand]; splendens [Thomson cabinet label]. The date '21 Juni' given in the published description is probably a typographical or copying error.

The holotype was designated 'lectotype' by Hinz (1963: 337). There can be no doubt that the specimen is a holotype because Thomson specifies 'ett ex'.

Identity. Junior synonym of *Dusona polita* (Foerster) (Hinz, 1963: 337).

Campoplex stenocarus, 1887*c*: 1083. Holotype ♀, SWEDEN: Gotland (lost).

The specimen labelled and published by Hinz (1963: 339) as holotype is from Småland (label 'Sm') and therefore cannot be the type.

Identity. Dusona stenocarus (Thomson).

Canidia anura, 1887*c*: 1113. Lectotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 282.

Labels. Ört. [hand]; anura [Thomson cabinet label].

Identity. Bathyplectes anurus (Thomson).

Canidia balteata, 1887*c*: 1114. Lectotype ♀, FRANCE: Scarpe near Lille (UZI, Lund), by designation of Aubert, 1968: 195.
Labels. Scarpe [hand]; balteata [Thomson cabinet label].
Thomson incorrectly attributed authorship of this species to Bridgman.
Identity. Bathyplectes balteatus (Thomson).

Canidia contracta, 1887*c*: 1113. Lectotype ♀, GERMANY (UZI, Lund), by designation of Horstmann, 1974*a*: 66.
Label. Mormal.
Identity. Junior synonym of *Bathyplectes anurus* (Thomson) (Horstmann, 1974*a*: 66).

Canidia corvina, 1887*c*: 1111. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund); by designation of Horstmann, 1974*a*: 70.
Label. L-d [printed].
Identity. Bathyplectes corvinus (Thomson).

Canidia curculionis, 1887*c*: 1113. Lectotype ♀, SWEDEN: Skåne, Stehag (UZI, Lund), by designation of Aubert, 1960: 490.
Labels. Steh 7/59 [hand]; Curculionis [Thomson cabinet label].
Identity. Bathyplectes curculionis (Thomson).

Canidia rostrata, 1887*c*: 1112. Lectotype ♀, SWEDEN: Skåne, Båstad (UZI, Lund), by designation of Aubert, 1972: 148.
Label. Båst [hand].
Identity. Bathyplectes rostratus (Thomson).

Canidia stenostigma, 1887*c*: 1114. Lectotype ♂, GERMANY (WEST): Aachen (UZI, Lund), by designation of Aubert, 1970: 276.
Labels. ♂ 21 gl. [hand]; Germ. [hand]; stenostigma [Thomson cabinet label].
Identity. Bathyplectes stenostigma (Thomson).

Canidia trochantella, 1887*c*: 1114. Lectotype ♀, FRANCE/SPAIN: Pyrenees (UZI, Lund), by designation of Horstmann, 1974*a*: 77.
Labels. Pyr. [hand]; trochantella [Thomson cabinet label].
Aubert's lectotype designation (1966: 130) is not considered valid because he did not indicate (in the publication or on the labels) which of the two specimens on the mount was designated. The lectotype is the left hand specimen.
Identity. Junior synonym of *Biolysia tristis* (Gravenhorst) (Horstmann, 1974*a*: 77).

Casinaria alboscutellaris, 1887*c*: 1098. Holotype ♂, GERMANY (UZI, Lund).
Labels. Oerfelse, Aug [hand, ?? first word]; Casin. orbital. var. Scut. albo. [hand].
Identity. Junior synonym of *Casinaria orbitalis* (Gravenhorst).

Casinaria alpina. 1887*c*: 1100. Holotype ♂, 'TYROLEN' (UZI, Lund).
Labels. 86./273. ['86' hand, '273' printed]; 42. [hand].
Identity. Casinaria alpina Thomson.

Casinaria ischnogaster, 1887*c*: 1101. LECTOTYPE ♀, SWEDEN: Skåne, Löparöd (UZI, Lund), here designated (selected by R. Hinz).
Labels. Löp [hand]; ♀ [printed]; ischnogaster [Thomson cabinet label].
Identity. Casinaria ischnogaster Thomson.

Casinaria monticola, 1887*c*: 1100. Holotype ♂, FRANCE: Pyrenees (UZI, Lund).
Labels. Berck. [hand]; Gall. [hand]; monticola [Thomson cabinet label].
Identity. Casinaria monticola Thomson.

Casinaria protensa, 1887*c*: 1102. LECTOTYPE ♂, GERMANY (UZI, Lund), here designated (selected by J. F. Aubert).
Label. protensa [Thomson cabinet label].
Identity. Casinaria protensa Thomson.

Casinaria scabra, 1887*c*: 1099. Lectotype ♀, FRANCE (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 280.
Labels. Berck. [hand]; Gall. [hand]; scabra [Thomson cabinet label]; scabra m [hand].
Identity. Casinaria scabra Thomson.

Casinaria subglabra, 1887*c*: 1101. LECTOTYPE ♀, ITALY: Trieste (ZSBS, Munich), here designated (selected by K. Horstmann).

Labels. Triest 22.5.71. Krchb. [hand]; 536. [hand]; rufimanus ♂ Gr. subglabra Thms. O.E. 1101.9. [hand].

Identity. Casinaria subglabra Thomson.

Catoglyptus (Stiphrosomus) canaliculatus, 1894: 1973. Type(s) ♀, GERMANY (lost).

Aubert's publication of a neotype female (1972: 147) for this species is not valid because it does not comply with the provisions of Article 75(c) of the *Code*. No attempt is made to validate that 'neotype' here because there has been no recent revisionary work on this group.

Identity. Sympherta canaliculata (Thomson) (Aubert, 1972: 147, on the basis of the invalid 'neotype').

Catoglyptus (Asthenarus) fusiformis, 1894: 1975. Syntypes 1 ♀, 1 ♂, FRANCE (UZI, Lund).

Labels. Oignies [hand]; fusiventris [Thomson cabinet label] (♀). Oignies [hand] (♂).

Identity. Syntactus fusiformis (Thomson) **comb. n.**

Catoglyptus (Asthenarus) scabriculus, 1894: 1975. Holotype ♂ [not ♀ as stated by Thomson], SWEDEN: Skåne, Yddinge (UZI, Lund).

Label. Ydd. [hand].

Thomson was misled into believing the specimen to be a female by an elongate piece of debris attached beneath the apex of the gaster.

Identity. Syntactus scabriculus (Thomson) **comb. n.**

Catoglyptus (Stiphrosomus) sulcatus, 1894: 1974. Lectotype ♂, SWEDEN: Norrland (UZI, Lund), by designation of Jussila, 1967: 110.

Labels. Norl. [printed]; sulcatus m [hand].

Identity. Sympherta sulcata (Thomson).

Catomicrus trichops, 1888*b*: 1293. Lectotype ♀, SWEDEN: Norrland, Lappland (UZI, Lund), by designation of Aubert, 1972: 147.

Label. Lpl. [printed].

Identity. Junior synonym of *Eusterinx pusilla* (Zetterstedt) (Townes, 1971: 203).

Centeterus (Eparces) grandiceps, 1891: 1638. LECTOTYPE ♂, SWEDEN: Skåne, Pålsjö (UZI, Lund), here designated (selected by H. K. Townes).

Label. Pål [hand].

Identity. Eparces grandiceps (Thomson).

Centeterus (Centeterus) nigricornis, 1891: 1638. Holotype ♀, FRANCE: Avignon (UZI, Lund).

Labels. Avignon [hand]; nigricornis [Thomson cabinet label].

Identity. Centeterus nigricornis Thomson.

Chorinaeus australis, 1887*b*: 201. Type(s) ♂, ITALY: Trieste (lost).

Identity. Chorinaeus australis Thomson *nomen dubium* (Aeschlimann, 1975: 725).

Chorinaeus brevicalcar, 1887*b*: 200. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Aeschlimann, 1975: 735.

Labels. Pål. [hand]; brevicalcar [Thomson cabinet label].

Identity. Chorinaeus brevicalcar Thomson.

Chorinaeus facialis, 1887*b*: 202. Lectotype ♀, SWEDEN (UZI, Lund), by designation of Aeschlimann, 1973*a*: 982.

Labels. Coll. L-gh. [printed]; facialis [Thomson cabinet label].

Identity. Trieces facialis (Thomson).

Chorinaeus longicalcar, 1887*b*: 201. Lectotype ♀, GERMANY (EAST): Schwerin (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 347.

Labels. f. 12/5. 85 [hand]; Germ. [hand]; longicalcar [Thomson cabinet label].

Identity. Chorinaeus longicalcar Thomson.

Chorinaeus longicornis, 1887*b*: 201. Lectotype ♀, SWEDEN: Skåne, Yddinge (UZI, Lund), by designation of Aeschlimann, 1975: 739.

Labels. ♀ [printed]; Yd [hand] [not 'Apd' as stated by Aeschlimann (1975: 739)]. A third, pencil-written, label is illegible.

Identity. Chorinaeus longicornis Thomson.

Chorinaeus nitifrons, 1887*b*: 202. Lectotype ♀, SWEDEN: Skåne, Arrie (UZI, Lund), by designation of Aeschlimann, 1973*a*: 986.
Labels. Ar [hand]; ♀ [printed]; nitifrons [Thomson cabinet label].
Identity. *Trieces nitifrons* (Thomson).

Coleocentrus heteropus, 1894: 2122. Holotype ♀, SWEDEN: Småland (UZI, Lund).
Label. heteropus m [Thomson cabinet label].
Identity. *Coleocentrus heteropus* Thomson.

Colpognathus armatus, 1891: 1636. Syntypes 1 ♀, 2 ♂, FRANCE (UZI, Lund).
Labels. Avignon. [hand] (♀). Toulouse. [hand]; armatus [Thomson cabinet label] (1 ♂). 29.6.89 Marg . . . . [illegible] [hand] (1 ♂).
The male specimen from Montpellier, which Thomson mentions, is in the collection of the Zoological Museum, Copenhagen. It is labelled: Montpellier [hand]; [green square]; ♂ [printed]; armatus Thms [hand]; Coll. Wüstnei [printed]. It should perhaps be excluded from the syntype series under Article 72(b) of the *Code*.
Identity. *Colpognathus armatus* Thomson.

Colpognathus divisus, 1891: 1636. Syntypes 4 ♀, 4 ♂, SWEDEN: Skåne (UZI, Lund).
Labels. Hbg [hand] (3 ♀, 2 ♂). Örtofta [printed]; divisus m [Thomson cabinet label] (1 ♀). Scan [printed] (1 ♂). Ld [rest illegible] [hand] (1 ♂).
Identity. *Colpognathus divisus* Thomson.

Colpognathus pentagonus, 1891: 1637. Holotype ♀, GREECE: Corfu (ZSBS, Munich).
Labels. Graecia. [printed]; h. [hand]; Colpognathus [hand].
Schmiedeknecht (1903: 301–302) gives further details of the holotype.
Identity. *Dicaelotus pentagonus* (Thomson) **comb. n.** (det. E. Diller).

Cratocryptus annulitarsis, 1873: 526. Syntypes 1 ♀, 2 ♂, SWEDEN: Skåne, Arrie and DENMARK: Zealand (UZI, Lund).
Labels. annulitarsis [Thomson cabinet label] (♀). Ar 6/56 [hand] (1 ♂). Dan [hand] (1 ♂).
Identity. *Cubocephalus annulitarsis* (Thomson).

Cratocryptus bispinus, 1894: 2117. Holotype ♂, SWEDEN: Norrland (UZI, Lund).
Labels. Norrl. [printed]; bispinus m [Thomson cabinet label].
Identity. Junior synonym of *Amphibulus gracilis* Kriechbaumer (teste J. Sawoniewicz).

Cratocryptus femoralis, 1873: 527. Syntypes 1 ♀, DENMARK: Zealand, Dyrehaven (ZM, Copenhagen); 1 ♂, SWEDEN: Skåne, Skabersjö (UZI, Lund).
Labels. ♀ 5/1860 Dyrehav. Drewsen [hand]; Danmark ex coll. Schiødte [printed] (♀). Skb [hand]; femoralis [Thomson cabinet label] (♂).
Identity. *Cubocephalus femoralis* (Thomson) **comb. n.**

Cratocryptus opacus, 1873: 523. Syntypes 2 ♀, 1 ♂, SWEDEN: Skåne, Mölle and Ringsjön (UZI, Lund).
Labels. Möl [hand]; opacus [Thomson cabinet label] (1 ♀). [small green square] (1 ♀ 1 ♂).
Identity. *Javra opaca* (Thomson).

Cratocryptus pleuralis, 1873: 526. Lectotype ♀, SWEDEN: Norrland (UZI, Lund), by designation of Aubert, 1972: 148.
Label. Norl. [printed].
Identity. *Parmortha pleuralis* (Thomson).

Cratocryptus ruficoxis, 1873: 525. Syntypes 5 ♀, 3 ♂, SWEDEN: Skåne, Pålsjö and Ringsjön (UZI, Lund).
Labels. Pål. [hand] (3 ♀ 2 ♂). Ringsiö [printed] (1 ♀). [green square] (1 ♀). Scan med. [printed] (1 ♂).
Identity. *Cubocephalus ruficoxis* (Thomson) **comb. n.**

Cratocryptus sternocerus, 1873: 523. Lectotype ♀, SWEDEN: Skåne, Skabersjö (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 157.
Labels. Skb [hand]; sternocerus [Thomson cabinet label].
Identity. *Cubocephalus sternocerus* (Thomson).

Cremastus crassicornis, 1890: 1445, 1454. LECTOTYPE ♂, GERMANY (UZI, Lund), here designated.
Labels. 538 [hand]; Germ. [hand]; crassicornis [Thomson cabinet label].
The lectotype is the specimen presumed by Šedivý (1970: 22) to be the holotype. However, Thomson must have had more than one specimen because he gives a range of length ('long. $2\frac{1}{2}$–3 lin.') for the species.
Identity. *Cremastus crassicornis* Thomson.

Cremastus guttifer, 1890: 1444, 1449. Lectotype ♂, SWEDEN: Skåne, Kjeflinge [= Kävlinge] (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 312.
Labels. Kfge [hand]; guttifer [Thomson cabinet label].
Identity. Temelucha guttifer (Thomson).

Cremastus laeviusculus, 1890: 1445, 1454. Lectotype ♀, SWEDEN: Öland (UZI, Lund), by designation of Šedivý, 1970: 33–34.
Labels. Ö. [printed]; sublaevis [Thomson cabinet label].
Identity. Junior synonym of *Cremastus pungens* Gravenhorst (Šedivý, 1970: 33).

Cremastus macrostigma, 1890: 1444, 1448. Lectotype ♀, FRANCE: Lille (UZI, Lund), by designation of Aubert, 1968: 196.
Label. Gall [hand].
Identity. Junior synonym of *Temelucha ophthalmica* (Holmgren) (Šedivý, 1971: 25).

Cremastus radialis, 1890: 1445, 1453. Holotype ♀, SWEDEN: Gotland (UZI, Lund).
Labels. G. [hand] [not 'f' as stated by Šedivý, 1970: 32]; radialis [Thomson cabinet label].
Identity. Junior synonym of *Cremastus lineatus* Gravenhorst (Šedivý, 1970: 31).

Cremastus schoenobius, 1890: 1444, 1446. Lectotype ♀, SWEDEN: Skåne, Kjellby [= Källby] (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 313.
Label. Sk. [hand] [not 'St' as stated by Šedivý, 1971: 28].
Identity. Temelucha schoenobia (Thomson).

Cremastus subnasutus, 1890: 1445, 1450. Lectotype ♀, GERMANY (UZI, Lund), by designation of Aubert, 1966: 131.
Labels. 535. [hand]; Germ. [hand]; subnasutus [Thomson cabinet label].
Identity. Temelucha subnasuta (Thomson).

Cryptus arenicola, 1873: 484. Lectotype ♀, SWEDEN: Skåne, Ilstorp (UZI, Lund), by designation of van Rossem, 1969*b*: 323.
Labels. Ilsp 6/7 [hand]; arenicola [Thomson cabinet label].
Identity. Itamoplex arenicola (Thomson) **comb. n.**

Cryptus borealis, 1873: 484. Lectotype ♀, SWEDEN: Norrland (UZI, Lund), by designation of van Rossem, 1969*b*: 337.
Label. Norl. [printed].
Identity. Junior synonym of *Itamoplex dianae* (Gravenhorst) (van Rossem, 1969*b*: 336).

Cryptus curvicauda, 1896: 2350. Lectotype ♀, SWEDEN: Östergöthland [= Östergötland] (UZI, Lund), by designation of van Rossem, 1971: 203.
Labels. O.G. [printed]; bellitarsis m. [Thomson cabinet label].
Identity. Junior synonym of *Buathra tarsoleuca* (Schrank) (van Rossem, 1971: 203).

Cryptus infumatus, 1873: 481. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of van Rossem, 1969*b*: 343.
Label. Pål [hand].
Identity. Junior synonym of *Itamoplex titubator* (Thunberg) (van Rossem, 1969*b*: 341).

Cryptus latitarsis, 1873: 483. Lectotype ♀, SWEDEN: Oland, Borgholm (UZI, Lund), by designation of van Rossem, 1969*a*: 177.
Label. Oel [printed].
Identity. Junior synonym of *Meringopus titillator* (Linnaeus) (van Rossem, 1969*a*: 174).

Cryptus serratus, 1873: 478. Holotype ♀, SWEDEN: Skåne, Bögestad [= Bökestad] (UZI, Lund).
Labels. Bgs. [hand]; serratus [Thomson cabinet label].
Identity. Junior synonym of *Meringopus nigerrimus* (Fonscolombe) (van Rossem, 1969*a*: 191).

Cryptus subquadratus, 1873: 478. Lectotype ♀, SWEDEN: Skåne, Esperöd [= Äsperöd] (UZI, Lund), by designation of van Rossem, 1969*b*: 364.
Label. Scania [printed].
The lectotype was labelled 'type' (= holotype) by Townes and Townes, Momoi & Townes (1965: 184) were almost certainly correct in recognising it as such. However, van Rossem chose to designate it as lectotype. He did not present any evidence of a syntype series.
Identity. Itamoplex subquadratus (Thomson).

Ctensicus albicoxa, 1883: 891. Holotype ♀, SWEDEN: Skåne, Ryssiöholm [= Rössjöholm] (UZI, Lund).
Labels. Rshm 16/6 [hand]; albicoxa [Thomson cabinet label].
Identity. Eridolius albicoxa (Thomson).

Ctenicus brevigena, 1883: 893. Holotype ♀, SWEDEN: Skåne, Stehag (UZI, Lund).
Label. [small green square].
Identity. Eridolius brevigena (Thomson).

Ctenicus breviventris, 1883: 890. Lectotype ♂, SWEDEN: Skåne, Torekov (UZI, Lund), by designation of Kerrich, 1952: 439.
Label. Tkov 7/60 [hand].
Identity. Junior synonym of *Eridolius rufonotatus* (Holmgren) (Kerrich, 1952: 437).

Ctenicus deletus, 1883: 894. Holotype ♀, SWEDEN: Norrland (UZI, Lund).
Labels. Norl. [printed]; deletus [Thomson cabinet label].
Identity. Eridolius deletus (Thomson).

Ctenicus genalis, 1883: 894. Holotype ♀, SWEDEN: Skåne, Alnarp (UZI, Lund).
Labels. Scan [printed]; genalis [Thomson cabinet label].
Identity. Eridolius genalis (Thomson) **comb. n.**

Ctenicus lineiger, 1883: 894. LECTOTYPE ♂, SWEDEN: Östergötland, Mjölsefall (NR, Stockholm), here designated.
Labels. 5 ug 5/8 Mjfall. [hand]; ♂ [hand]; extirpatorius Gr sec. Hgn. [hand].
The lectotype is the specimen recognised by Kerrich (1952: 425) as 'type'. It is not clear from Kerrich's statement whether he intended to make a type restriction or merely recognised the specimen as one of the syntypes.
Identity. Eridolius lineiger (Thomson).

Ctenicus marginatus, 1883: 892. LECTOTYPE ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), here designated (selected by G. J. Kerrich).
Label. Ört. [hand].
Identity. Eridolius marginatus (Thomson).

Ctenicus punctipes, 1883: 892. LECTOTYPE ♀, SWEDEN: Lappland (UZI, Lund), here designated (selected by G. J. Kerrich).
Label. Lpl. [printed].
Identity. Eridolius punctipes (Thomson).

Ctenicus punctipleuris, 1883: 893. Syntypes ♀♂, SWEDEN: Skåne, Kjellby [= Källby] (lost).
Identity. ? Eridolius punctipleuris (Thomson) **comb. n.**

Ctenicus quadrinotatus [as *4-notatus*], 1883: 892. Holotype ♀, SWEDEN: Lappland (UZI, Lund).
Labels. Lpl. [printed]; 4-notatus [Thomson cabinet label].
Identity. Eridolius quadrinotatus (Thomson) **comb. n.**

Ctenicus signifer, 1883: 893. LECTOTYPE ♀, SWEDEN: Skåne, Lindholmen (UZI, Lund), here designated (selected by G. J. Kerrich).
Labels. Lhn 15/7 [hand]; 109. [hand].
Identity. Eridolius signifer (Thomson).

Ctenicus t-nigrum, 1883: 891. LECTOTYPE ♀, SWEDEN: Skåne, Klinta (UZI, Lund), here designated (selected by G. J. Kerrich [labelled as 'holotype']).
Labels. Scan [printed]; ♀ [printed].
Identity. Eridolius t-nigrum (Thomson).

Ctenopelma verticina, 1883: 925. Syntypes 5 ♀, SWEDEN: Skåne, Alnarp (UZI, Lund).
Labels. Scan [printed]; verticina [Thomson cabinet label] (1 ♀). Scan [printed] (4 ♀).
Identity. Ctenopelma verticinum Thomson.

Cymodusa longicalcar, 1887*c*: 1096. Type(s) [? sex], SWEDEN: Skåne, Esperöd [= Äsperöd] (lost).
Identity. Cymodusa longicalcar Thomson.

Deloglyptus punctiventris, 1891: 1623. LECTOTYPE ♀, SWEDEN: Skåne, Lund (UZI, Lund), here designated (selected by H. K. Townes).
Labels. Scan [printed]; punctiventris m [Thomson cabinet label].
Identity. Dicaelotus punctiventris (Thomson).

Delotomus auriculatus, 1883: 884. Syntypes 3 ♀, 2 ♂, SWEDEN: Skåne, Pålsjö and Ilstorp (UZI, Lund).
Labels. Pål [hand]; auriculatus [Thomson cabinet label] (1 ♂). Pål [hand] (2 ♀). Ilsp 26/6 [hand] (1 ♀ 1 ♂).
Identity. Junior synonym of *Acrotomus lucidulus* (Gravenhorst) (Kerrich, 1952: 452).

Delotomus binotatus, 1883: 886. Lectotype ♀, SWEDEN: Öland (UZI, Lund), by designation of Kerrich, 1952: 328.
Labels. Ö. [printed]; binotatus [Thomson cabinet label].
Identity. Junior synonym of *Cycasis rubiginosus* (Gravenhorst) (Kerrich, 1952: 328).

Delotomus calcaratus, 1883: 885. Holotype ♂, SWEDEN: Norrland (UZI, Lund).
Labels. Norl. [printed]; calcaratus [Thomson cabinet label].
Identity. Junior synonym of *Kristotomus laetus* (Gravenhorst) (Kerrich, 1952: 347).

Delotomus marginatus, 1883: 885. Syntypes 1 ♀, 1 ♂, SWEDEN: Öland, Isgärde (UZI, Lund).
Label. Ö. [printed].
Both specimens are on the same pin.
Identity. Junior synonym of *Kristotomus laetus* (Gravenhorst) (Kerrich, 1952: 346).

Delotomus parvulus, 1883: 886. Type(s) [? sex], SWEDEN: Öland (lost).
Identity. Junior synonym of *Cycasis rubiginosus* (Gravenhorst) (Kerrich, 1952: 328).

Demophorus annellatus, 1890: 1458. LECTOTYPE ♂, SWEDEN: Skåne, Kjeflinge [= Kävlinge] (UZI, Lund), here designated.
Labels. Kfge [hand]; annellatus [Thomson cabinet label].

There are already three published mentions of a lectotype for this species but none constitutes a proper designation. The earliest (Aubert, 1959: 163) was apparently not intended to be a designation and includes no details of any particular syntype specimen.The second (Aubert, 1966: 131) specifies '♂' and 'No. 1' but the pin (the first in the series) bears three males (and an additional empty card point) and there is no indication either in the publication or on Aubert's label which specimen is intended to be the lectotype. The third (Šedivý, 1970: 6) refers to Aubert's first publication (incorrectly as 1958); does not specify a particular specimen; and gives the sex, incorrectly, as female.

In order to clarify the situation a lectotype is designated here. It is the lowest of three male specimens on the pin bearing Aubert's lectotype label.
Identity. Junior synonym of *Dimophora evanialis* (Gravenhorst) (Šedivý, 1970: 5).

Demophorus arenicola, 1890: 1457. Lectotype ♀, SWEDEN: Skåne, Ilstorp (UZI, Lund), by designation of Šedivý, 1970: 7.
Label. Ilsp 15/7 [hand].
Identity. Junior synonym of *Dimophora robusta* Brischke (Šedivý, 1970: 6).

Diaborus filipalpis, 1883: 889. Lectotype ♀, SWEDEN: Skåne, Holmeja (UZI, Lund), by designation of Kerrich, 1953: 154 [as 'type'].
Label. Hme [hand].
Identity. Junior synonym of *Cteniscus pedatorius* (Panzer) (Kerrich, 1953: 158).

Diaborus frontalis, 1883: 889. Syntypes 2 ♀, 4 ♂, SWEDEN: Skåne, Örtofta (UZI, Lund).
Labels. Ört [hand]; frontalis [Thomson cabinet label] (1 ♂). Ört. [hand] (1 ♀ 2 ♂). Örtofta [printed] (1 ♂). [hand, illegible]; Ört. [hand] (1 ♀).
Identity. Cteniscus frontalis (Thomson) **comb. n.**

Diaborus nigrifrons, 1883: 889. Type(s), SWEDEN: Skåne, Esperöd [= Äsperöd] (lost).
Neotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Kerrich, 1953: 153–154.
Labels. Pål [hand]; nigrifrons [Thomson cabinet label].
Identity. Cteniscus nigrifrons (Thomson).

Diaborus pallitarsis, 1883: 889. Lectotype ♀, SWEDEN: Skåne, Esperöd [= Äsperöd] (UZI, Lund), by designation of Kerrich, 1953: 152.
Labels. Scan [printed]; pallitarsis [Thomson cabinet label].
Identity. Cteniscus pallitarsis (Thomson).

Diadromus (Diadromus) arcticus, 1891: 1634. Syntypes 2 ♀, 1 ♂, SWEDEN: Lappland (UZI, Lund).
Labels. [two small squares of paper]; Lpl. [printed]; arcticus [Thomson cabinet label] (1 ♀). Åfolu 29 Jul. [hand]; Lpl. [printed] (1 ♀). [small square of paper]; Col. Ros [printed] (1 ♂).
Identity. Diadromus arcticus Thomson.

Diadromus (Diadromus) medialis, 1891: 1634. Syntypes 2♀, 1♂, Sweden: Lappland (UZI, Lund).

Labels. [small square of paper]; Col Ros [printed]; medialis m [Thomson cabinet label] (1♀). Norl. [printed] (1♀). [small square of paper]; Col Ros [printed] (♂).

The two females belong to different species, the one labelled 'Norl.' has the gaster missing and the other has the head missing.

Identity. Diadromus medialis Thomson.

Dicoelotus [lapsus for *Dicaelotus*] ***(Cinxaelotus) annellatus***, 1891: 1621. Holotype ♀, Sweden: Öland (UZI, Lund).

Label. Ö. [printed].

Identity. Dicaelotus annellatus Thomson.

Dicoelotus [lapsus for *Dicaelotus*] ***(Cinxaelotus) crassifemur***, 1891: 1620. Lectotype ♀, Sweden: Skåne, Ilstorp (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 423.

Labels. Ilsp 13/7 [hand]; crassifemur m [Thomson cabinet label].

Identity. Dicaelotus crassifemur Thomson.

Dicoelotus [lapsus for *Dicaelotus*] ***(Dicoelotus)*** [lapsus] ***inflexus***, 1891: 1619. Syntypes 2♀, Sweden: Skåne, Kjeflinge [= Kävlinge] (UZI, Lund).

Labels. Kfge [hand]; inflexus [Thomson cabinet label] (1♀). Kfge [hand] (1♀).

Identity. Dicaelotus inflexus Thomson.

Dicoelotus [lapsus for *Dicaelotus*] ***(Dicoelotus)*** [lapsus] ***orbitalis***, 1891: 1621. Holotype ♀, Sweden: Skåne, Stehag (UZI, Lund).

Labels. Steh 2/5 [hand]; orbitalis m [Thomson cabinet label].

Identity. Dicaelotus orbitalis (Thomson).

Ephialtes abbreviatus, 1877: 740. Syntypes 7♀, 1♂, Sweden: Skåne (UZI, Lund).

Labels. Pål [hand]; abbreviatus [hand] (1♀). Pål [hand] (3♀). [small green square] (2♀). Scan [printed] (1♀). Tkov 7/60 [hand]; abbreviatus [hand] (1♂).

Identity. Junior synonym of *Dolichomitus populneus* (Ratzeburg) (Oehlke, 1967: 14).

Ephialtes antefurcalis, 1877: 741. Holotype ♀, Sweden: Skåne (UZI, Lund).

Labels. Sk [printed].

Townes, Momoi & Townes (1965: 17) say 'Types' (= syntypes) but there is no reason to suppose that the one female from Skåne should not be the only original specimen (= holotype).

Identity. Junior synonym of *Townesia tenuiventris* (Holmgren) (Oehlke, 1967: 11).

Ephialtes crassiceps, 1877: 739. Type(s) [? sex], Sweden: Lappland (lost).

Perkins (1943*a*: 255, 256) indicated that he had seen 'the type or the type series' of this species but there are no specimens in the collection which can be types.

Identity. Junior synonym of *Dolichomitus dux* (Tschek) (Oehlke, 1967: 13).

Ephialtes crassiseta, 1877: 743. Holotype ♀, Sweden: Norrland (UZI, Lund).

Label. Norl. [printed].

Identity. Liotryphon crassisetus (Thomson).

Ephialtes gnathaulax, 1877: 739. Lectotype ♀, Sweden: Skåne (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 18.

Label. Scan bor. [printed].

Identity. Paraperithous gnathaulax (Thomson).

Ephialtes heteropus, 1888*b*: 1249. Holotype ♀, Sweden: Skåne, Lund (UZI, Lund).

Labels. Lund [printed]; exclusus e Cerambyx moschata [hand]; heteropus n. sp. [hand].

Identity. Junior synonym of *Dolichomitus messor* (Gravenhorst) (Oehlke, 1967: 13).

Ephialtes luteipes, 1877: 740. Holotype ♀, Sweden: Skåne (UZI, Lund).

Label. Scan [printed].

There is a second female in the collection (from Bökestad in Skåne [label 'Bgs']) which could also be the type but which is not in such good agreement with the original description.

Identity. Paraperithous luteipes (Thomson).

Ephialtes macrurus, 1894: 2123. Holotype ♀, Sweden: Stockholm (UZI, Lund).

Labels. Holm [printed]; macrurus m [hand].

Identity. Junior synonym of *Dolichomitus cognator* (Thunberg) (Oehlke, 1967: 12).

Ephialtes parallelus, 1888*b*: 1248. Lectotype ♀, SWEDEN: Skåne, Farhult (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 22.

Labels. E. tubercula. tus. ♀. 3. 228 105. O. foveolata Fall. [hand]; parallelus m Farhult [hand].

Identity. Junior synonym of *Dolichomitus tuberculatus* (Geoffroy) (Oehlke, 1967: 15).

Ephialtes planifrons, 1877: 741. Holotype ♀, SWEDEN: Norrland (UZI, Lund).

Label. Norl. [printed].

Identity. Junior synonym of *Dolichomitus terebrans* (Ratzeburg) (Oehlke, 1967: 15).

Ephialtes pleuralis, 1877: 744. Holotype ♀, SWEDEN: Lappland (UZI, Lund).

Labels. [small square of paper]; Col Ros [printed]; pleuralis [hand].

Identity. Junior synonym of *Liotryphon crassisetus* (Thomson) (Oehlke, 1967: 9).

Ephialtes scutellaris, 1877: 738. Type(s) ♀, SWEDEN: Skåne (lost).

Perkins (1943*a*: 256) indicated that he had seen 'the type or the type series' of this species but there are no specimens in the collection which can be types.

Identity. Dolichomitus scutellaris (Thomson) (Oehlke, 1967: 14).

Epitomus parvus, 1891: 1626. Lectotype ♂, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Aubert, 1966: 128.

Label. L-d [printed].

Identity. Epitomus parvus Thomson.

Erromenus arenicola, 1883: 905. Syntype 1 ♂, SWEDEN: Skåne, Degeberga (UZI, Lund).

Label. Dgb. [hand].

Identity. Junior synonym of *Erromenus junior* (Thunberg) (Kasparyan, 1973: 296).

Erromenus brevitarsis, 1883: 904. Syntypes 4 ♀, SWEDEN: Skåne, Klinta (UZI, Lund).

Labels. Rsiö [printed]; brevitarsis [Thomson cabinet label] (1 ♀). Rsiö [printed] (1 ♀). [small green square] (2 ♀).

Identity. Junior synonym of *Erromenus plebejus* (Woldstedt) (Kasparyan, 1973: 299).

Erromenus cavigena, 1883: 904. Lectotype ♂, SWEDEN: Skåne, Rönnemölla (UZI, Lund), by designation of Aubert, 1968: 195.

Labels. Rön [hand]; ♂ [printed]; cavigena [Thomson cabinet label].

Identity. Junior synonym of *Erromenus melanotus* (Gravenhorst) (Kasparyan, 1973: 298).

Erromenus simplex, 1883: 905. Lectotype ♀, SWEDEN: Norrland (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 104.

Labels. Norl. [printed]; simplex [Thomson cabinet label].

Identity. Junior synonym of *Erromenus punctatus* (Woldstedt) (Kasparyan, 1973: 301).

Eurylabus vinulator, 1894: 2102. LECTOTYPE ♂, SWEDEN: Skåne, Stehag (NM, Göteborg), here designated.

Labels. Ste CM [hand].

The lectotype is in the G. F. Möller collection and is one of the two specimens specifically mentioned by Thomson. The original syntype series of this species consists of the lectotype and a male in Marklins collection (there are two males from Marklins collection in Uppsala) together with the material which formed the bases of the publications of Degeer, Wesmael and Holmgren cited by Thomson.

Identity. Junior synonym of *Eurylabus larvatus* (Christ).

Euryproctus (Syndipnus) atricornis, 1883: 928. Syntypes 8 ♀, 5 ♂, SWEDEN: Skåne, Lund (UZI, Lund).

Labels. L-d [printed]; atricornis [Thomson cabinet label] (3 ♀ on one pin). Ld [hand] (1 ♀). L-d [printed]; Synoditus [hand] (2 ♀ 1 ♂ on one pin). [No label] (2 ♀ 2 ♂ on one pin). [No label] (2 ♂ on one pin).

Identity. Syndipnus atricornis (Thomson).

Euryproctus (Himertus) bisannulatus, 1883: 928. Syntypes 5 ♀, 4 ♂, SWEDEN: Skåne (UZI, Lund).

Labels. [green square]; ♀ [printed]; bisannulatus [Thomson cabinet label] (1 ♀). Scania [printed] (1 ♀). Ört. [hand] (2 ♂). Ört. [hand]; ♀ [printed] (1 ♀). [green square] (1 ♀ 1 ♂). Ringsiö [printed] (1 ♀). Rsiö [printed] (1 ♂).

Identity. Himerta bisannulata (Thomson).

Euryproctus (Euryproctus) crassicornis, 1889: 1433. LECTOTYPE ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), here designated (selected by M. Idar).

Labels. Pålsiö [printed]; crassicornis [Thomson cabinet label].

Identity. Euryproctus crassicornis Thomson.

Euryproctus (Euryproctus) exareolatus, 1889: 1435. LECTOTYPE ♂, Sweden: Skåne, Ringsjön (UZI, Lund), here designated (selected by M. Idar).
Label. Rsiö [printed].
Identity. *Euryproctus exareolatus* Thomson.

Euryproctus (Euryproctus) inferus, 1889: 1435. Holotype ♀, Sweden: Skåne, Yddinge (UZI, Lund).
Labels. Yddinge [printed]; inferus [Thomson cabinet label].
Identity. *Euryproctus inferus* Thomson.

Euryproctus (Phobetus) liopleuris, 1889: 1431. Syntype 1 [? sex], Sweden: Skåne, Örtofta (UZI, Lund).
Label. Ört [hand].
The gaster is missing from the specimen.
Identity. *Phobetes liopleuris* (Thomson).

Euryproctus (Syndipnus) macrocerus, 1883: 928. LECTOTYPE ♀, Sweden: Skåne, Ryssjöholm [= Rössjöholm] (UZI, Lund), here designated (selected by H. K. Townes).
Label. Rshm 16/6 [hand].
Identity. *Syndipnus macrocerus* (Thomson).

Euryproctus (Euryproctus) nitidulus, 1889: 1436. Holotype ♀, Sweden: Skåne, Arrie (UZI, Lund).
Labels. Ar [hand]; nitidulus [Thomson cabinet label].
Identity. *Euryproctus nitidulus* Thomson.

Euryproctus (Euryproctus) parvulus, 1883: 926. LECTOTYPE ♀, Sweden: Skåne, Fogelsång [= Fågelsång] (UZI, Lund), here designated (selected by M. Idar).
Labels. Fsg 1/7 [hand]; ♀ [printed].
Identity. *Euryproctus parvulus* Thomson.

Exenterus (Exenterus) claripennis, 1883: 887. Syntypes ♀ ♂, Sweden: Skåne, Wittsiö [= Vittsjö] (lost).
Neotype ♀, Sweden: Dalarne, Fulufjäll (NR, Stockholm), by designation of Kerrich, 1952: 360.
Identity. *Exenterus claripennis* Thomson.

Exenterus (Exenterus) flavellus, 1883: 887. Holotype ♀, Sweden: Skåne Kjeflinge [= Kävlinge] (UZI, Lund).
Labels. [note, in Swedish, describing capture in pine plantation 19.ix.1839]; flavellus [Thomson cabinet label].
Identity. Junior synonym of *Exenterus oriolus* Hartig (Kerrich, 1952: 357).

Exenterus laricinus, 1888*b*: 1254. Holotype ♀, Sweden: Skåne, Ramlösa (UZI, Lund).
Labels. Raml. 7.85 [hand]; Laricinus [Thomson cabinet label].
Identity. *Exenterus laricinus* Thomson. Placed as a synonym of *Exenterus adspersus* Hartig by Kerrich (1952: 360), for which a lectotype has since been designated (Townes, Momoi & Townes, 1965: 114).

Exenterus (Exenterus) simplex, 1883: 887. Syntypes 2 ♀, Sweden: Gottland [= Gotland] (UZI, Lund).
Labels. Gott [printed] (1 ♀). [red square]; [grey square]; Suecia [printed]; muticus [hand] (1 ♀).
Identity. *Exenterus simplex* Thomson.

Exetastes guttifer, 1897: 2417. Lectotype ♀, Sweden: Gottland [= Gotland] (UZI, Lund), by designation of Aubert, 1972: 146.
Label. Gott [printed].
Identity. *Exetastes guttifer* Thomson.

Exochus annulitarsis, 1887*b*: 215. Syntype 1 ♀, Sweden: Skåne, Röstånga (UZI, Lund).
Label. Rötå [hand, partly illegible].
Thomson only gave 'Suecia' as the locality in the original description. Later (1894: 2136) he stated 'Funnen vid Röstånga: Skåne'. Seven other specimens are from other localities and were, therefore, probably added to the collection after 1894 and unlikely to be syntypes.
Identity. *Exochus annulitarsis* Thomson.

Exochus anospilus, 1887*b*: 217. Type(s) [? sex], Germany (lost).
There are two specimens in the collection from Dalmatia (label 'Dalm').
Identity. *Exochus anospilus* Thomson.

Exochus australis, 1894: 2137. Lectotype ♀, Italy: Trieste (UZI, Lund), by designation of Townes, Momoi &Townes, 1965: 358.
Label. 8.IX Triest. [date, hand; locality, printed].
Identity. *Exochus australis* Thomson.

Exochus citripes, 1887*b*: 213. Lectotype ♀, FRANCE: Lille, Oisy (UZI, Lund), by designation of Aubert, 1972: 147.

Labels. Oisy. [hand]; ♀ [printed]; citripes [Thomson cabinet label].

Identity. Exochus citripes Thomson.

Exochus crassicornis, 1894: 2134. Holotype ♀, SWEDEN: Dalsland (lost).

Identity. Exochus crassicornis Thomson.

Exochus incidens, 1887*b*: 208. Syntypes 4 ♀, 9 ♂, 2 [? sex], SWEDEN (UZI, Lund).

The syntype series includes material from the following localities: Skåne, Örtofta [label 'Ört']; Ringsjön [label, green square]; Kävlinge [label 'Kfge']; Västra Vram [label 'V.W.']. Öland [label 'Ö']. Gotland [label 'G.']. Östergötland [label 'OG'].

Identity. Exochus incidens Thomson.

Exochus lineifrons, 1887*b*: 213. Syntypes 4 ♀, 5 ♂, SWEDEN: Skåne, Pålsjö (UZI, Lund).

Thomson only gave 'Suecia' as the locality in the original description but later (1894: 2135) gave the more precise information 'vid Pålsjö'. All of the specimens in the collection are from this locality [labels 'Pålsiö' (printed) and 'Pål' (hand)].

Identity. Exochus lineifrons Thomson.

Exochus longicornis, 1887*b*: 214. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1966: 128.

Labels. Pålsiö [printed]; longicornis [Thomson cabinet label].

Identity. Exochus longicornis Thomson.

Exochus nigripalpis, 1887*b*: 209. Lectotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Townes & Townes, 1959: 217.

Label. Ört. [hand].

Identity. Exochus nigripalpis Thomson.

Exochus parvispina, 1887*b*: 216. Syntype 1 ♀, SWEDEN: Skåne, Bökeberg (UZI, Lund).

Labels. Bök 8/78 [hand]; parvispina [Thomson cabinet label].

Thomson only gave 'Suecia' as the locality in the original description. Later (1894: 2136) he stated 'Funnen vid Bökeberg i Skåne'. Therefore, a second female in the collection from Östergötland (label 'OG') probably post dates 1894 and is unlikely to be a syntype.

Identity. Exochus parvispina Thomson.

Exochus signifrons, 1887*b*: 216. LECTOTYPE ♀, SWEDEN: Jämtland, Åreskutan (UZI, Lund), here designated (selected by J. F. Aubert).

Labels. Areskut. lapp 2 Ag. [hand].

Thomson (1894: 2136) later referred to this species as *nigrifrons*. There is no evidence that this was a deliberate change and it is here regarded as an incorrect subsequent spelling (Article 33(b) of the *Code*).

Identity. Exochus signifrons Thomson.

Exyston brevipetiolatus, 1883: 883. Syntypes 7 ♀, 5 ♂, SWEDEN: Stockholm area and Småland, Anneberg (NR, Stockholm).

Labels. Hlm [printed]; Bhn [= Boheman] [printed] (4 ♀ 3 ♂). Sm [printed]; Bhn [printed] (3 ♀ 2 ♂).

The syntype series of this species comprised Thomson's own specimen(s) from 'Vestergöthland' (which are lost) together with the material which was the basis of Holmgren's misidentification of *Exenterus triangulatorius*.

Identity. Junior synonym of *Exyston pratorum* (Woldstedt) (Kerrich, 1952: 385).

Exyston calcaratus, 1883: 883. LECTOTYPE ♀, SWEDEN: Skåne, Pålsiö [= Pålsjö] (UZI, Lund), here designated (selected by H. K. Townes).

Labels. Pål. [hand]; calcaratus [Thomson cabinet label].

Identity. Exyston calcaratus Thomson.

Exyston carinatus, 1883: 882. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Kasparyan, 1975: 304.

Labels. Pål [hand]; carinatus [Thomson cabinet label].

Identity. Junior synonym of *Exyston sponsorius* (Fabricius) (Kasparyan, 1975: 304).

Exyston genalis, 1883: 883. Syntype 1 ♀, SWEDEN: Lappland (UZI, Lund).

Labels. [square of paper]; Col Ros [printed].

Identity. Exyston genalis Thomson.

Gambrus inferus, 1896: 2375. Syntype 1 ♂, SWEDEN: Skåne, Lund (UZI, Lund).
Label. Ld [hand].
Identity. Gambrus inferus Thomson.

Gambrus superus, 1896: 2375. Syntypes ♀ ♂, SWEDEN: Skåne, Ortofta (lost).
Aubert's publication of a male neotype (1966: 128) for this species is not valid because it does not comply with the provisions of Article 75(c) of the *Code*. No attempt is made to validate that 'neotype' here because there has been no recent revisionary work on the Palaearctic species of *Gambrus*.
Identity. Gambrus superus Thomson.

Glypta (Glypta) brevipetiolata, 1889: 1327, 1344. Lectotype ♀, SWEDEN: Skåne, Kjeflinge [= Kävlinge] (UZI, Lund), by designation of Aubert, 1978*b*: 38.
Label. Kfge [hand].
Identity. Glypta brevipetiolata Thomson.

Glypta (Glypta) breviventris, 1889: 1327, 1347. Holotype ♀, SWEDEN: Lappland (UZI, Lund).
Labels. Lap [hand]; breviventris [Thomson cabinet label].
Identity. Junior synonym of *Glypta crassitarsis* Thomson (Aubert, 1978*b*: 46).

Glypta (Glypta) caudata, 1889: 1326, 1337. Holotype ♀, SWEDEN: Skåne, Ringsjö (UZI, Lund).
Labels. Scania [printed]; caudata [Thomson cabinet label].
Identity. Glypta caudata Thomson.

Glypta (Glypta) crassitarsis, 1889: 1327, 1346. Lectotype ♀, SWEDEN: Norrland (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 211.
Label. Norl. [printed].
Identity. Glypta crassitaris Thomson.

Glypta (Glypta) crenulata, 1889: 1325, 1334. Lectotype ♂, FRANCE (UZI, Lund), by designation of Aubert, 1972: 146.
Labels. Gall [hand]; crenulata [Thomson cabinet label].
Identity. Junior synonym of *Apophua cicatricosa* (Ratzeburg) (Aubert, 1978*b*: 34).

Glypta (Glypta) dentifera, 1889: 1350. Syntypes 6 ♀, GERMANY (UZI, Lund).
Labels. Kösen 9.8.51 [hand]; Germ [hand]; dentifera [Thomson cabinet label] (1 ♀). Koesen 7.88 [hand]; Germ [hand] (3 ♀). Germ [hand] (2 ♀).
Identity. Glypta dentifera Thomson.

Glypta (Glypta) filicornis, 1889: 1328, 1351. Lectotype ♀, SWEDEN: Skåne (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 212.
Label. Sk [hand].
Identity. Junior synonym of *Glypta femorator* Desvignes (Aubert, 1978*b*: 40).

Glypta (Glypta) fractigena, 1889: 1325, 1334. Lectotype ♀, FRANCE: Lille (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 212.
Labels. Lille [hand]; Gall. [hand].
Identity. Junior synonym of *Glypta nigrina* Desvignes (Aubert, 1978*b*: 44).

Glypta (Glypta) heterocera, 1889: 1326, 1337. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1968: 194.
Label. Pål [hand].
Identity. Glypta heterocera Thomson.

Glypta (Glypta) microcera, 1889: 1328, 1350. Syntypes 4 ♀, GERMANY (WEST): Harz (UZI, Lund).
Labels. Harz 8.85 [hand]; microcera [Thomson cabinet label] (1 ♀). Harz 8.85. [hand] (3 ♀).
Identity. Glypta microcera Thomson.

Glypta (Glypta) nigricornis, 1889: 1328, 1353. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1972: 146.
Labels. Pål [hand]; nigricornis [Thomson cabinet label].
There is a male specimen (paralectotype) on the same pin as the lectotype.
Identity. Glypta nigricornis Thomson.

Glypta (Glypta) nigriventris, 1889: 1325, 1336. Lectotype ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), by designation of Aubert, 1976*a*: 154.
Label. [green square].

Aubert's prior publication of a neotype (1968: 194) for this species is, fortunately, not valid because it does not comply with the provisions of Article 75(c) of the *Code*. Therefore, no reference to the Commission is needed (Article 75(f)).

Identity. Junior synonym of *Glypta extincta* Ratzeburg (Aubert, 1978*b*: 60).

Glypta (Glypta) nigroplica, 1889: 1326, 1341. Lectotype ♀, SWEDEN: Skåne, Wittsjö [= Vittsjö] (UZI, Lund), by designation of Aubert, 1978*b*: 45.

Labels. Scan [hand]; nigroplica [Thomson cabinet label].

Identity. Glypta nigroplica Thomson.

Glypta (Glypta) rufipes, 1889: 1328, 1353. Lectotype ♀, SWEDEN: Oland (UZI, Lund), by designation of Aubert, 1966: 127.

Labels. O. [printed]; rufipes [Thomson cabinet label].

Although Townes, Momoi & Townes (1965: 212) were almost certainly correct in recognising this as 'Type' (= holotype, the single original specimen) Aubert chose to designate it as lectotype. He presented no evidence of a syntype series.

Identity. Junior primary homonym of *Glypta rufipes* Spinola, 1851 and of *Glypta rufipes* Brischke, 1865. Replacement name *Glypta thomsonii* Dalla Torre, 1901: 416. Junior synonym of *Glypta similis* Bridgman (Aubert, 1978*b*: 52).

Glypta (Glypta) salicis, 1889: 1328, 1348. Lectotype ♀, GERMANY (UZI, Lund), by designation of Aubert, 1978*b*: 50.

Labels. 46 [hand, on red paper]; Germ. [hand].

Thomson attributed this name to Hartig but it was never published by him.

Identity. Glypta salicis Thomson.

Glypta (Glypta) scutellaris, 1889: 1327, 1344. Lectotype ♀, SWEDEN: Skåne, Alnarp (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 213.

Labels. ALNARP [printed]; scutellaris [Thomson cabinet label].

The lectotype was labelled by Hinz, 1962 not Townes, 1965 as stated by Townes, Momoi & Townes (1965: 213).

Identity. Glypta scutellaris Thomson.

Glypta (Glypta) tegularis, 1889: 1325, 1335. Lectotype ♀, FRANCE: Pyrenees (UZI, Lund), by designation of Aubert, 1972: 146.

Labels. Pyren [hand]; tegularis [Thomson cabinet label].

Identity. Glypta tegularis Thomson.

Glypta (Glypta) tenuicornis, 1889: 1326, 1340. Lectotype ♀, GERMANY (WEST): Munich (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 214.

Label. Germ. [hand].

Identity. Glypta tenuicornis Thomson.

Glypta (Glypta) tenuitarsis, 1889: 1327, 1346. LECTOTYPE ♀, SWEDEN: Lappland (UZI, Lund), here designated (selected by J. F. Aubert).

Labels. Lap [hand]; tenuitarsis [Thomson cabinet label].

Aubert (1972: 146) published a lectotype designation for '*Glypta tenuiventris* Ths. (? recte *crassitarsis* Ths.?)'. Thomson did not describe a species *tenuiventris*, so Aubert's *tenuiventris* may have been a lapsus for *tenuitarsis*.

Identity. Junior synonym of *Glypta crassitarsis* Thomson (Aubert, 1978*b*: 46).

Glypta (Glypta) varicoxa, 1889: 1328, 1348. Lectotype ♀, SWEDEN: Skåne, Ringsiön [= Ringsjön] (UZI, Lund), by designation of Aubert, 1972: 146.

Labels. Scan [printed]; varicoxa [Thomson cabinet label].

Identity. Glypta varicoxa Thomson.

Glypta (Glypta) xanthognatha, 1889: 1325, 1335. Lectotype ♀, SWEDEN: Skåne, Skanör (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 214.

Label. Skan [hand].

Identity. Junior synonym of *Glypta consimilis* Holmgren (Aubert, 1978*b*: 59).

Goniocryptus annulicornis, 1896: 2357. Holotype ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund).

Labels. Ringsiö [printed]; annulicornis [Thomson cabinet label].

Identity. Junior synonym of *Trychosis mesocastanus* (Tschek) (van Rossem, 1966: 33).

Goniocryptus annulitarsis, 1873: 492. Lectotype ♀, SWEDEN: Skåne, Bögestad [= Bökestad] (UZI, Lund), by designation of van Rossem, 1966: 12.
Label. Böks 21/6 [hand].
Identity. Junior synonym of *Trychosis neglectus* (Tschek) (van Rossem, 1966: 10).

Goniocryptus clypearis, 1873: 494. Lectotype ♀, SWEDEN: Skåne, Degeberga (UZI, Lund), by designation of van Rossem, 1966: 33.
Labels. Dgb [hand]; clypearis [Thomson cabinet label].
The lectotype is the upper of two specimens on the same pin.
Identity. Junior synonym of *Trychosis legator* (Thunberg) (van Rossem, 1966: 24).

Goniocryptus glabriculus, 1873: 491. Lectotype ♀, SWEDEN: Norrland (UZI, Lund), by designation of Aubert, 1966: 128.
Label. Norl. [printed].
Identity. *Trychosis glabriculus* (Thomson).

Goniocryptus lapponicus, 1894: 2116. Lectotype ♀, SWEDEN: Lappland (UZI, Lund), by designation of van Rossem, 1966: 22.
Labels. Lapp [printed]; lapponicus [Thomson cabinet label].
Identity. Junior synonym of *Trychosis pauper* (Tschek) (van Rossem, 1966: 20).

Goniocryptus macrourus, 1873: 492. Lectotype ♀, DENMARK: Zealand, Strandmøllen (ZM, Copenhagen), by designation of van Rossem, 1966: 38.
Labels. ♀ Strandmo Drewsen [hand]; Danmark ex coll. Schiødte [printed].
Identity. Junior synonym of *Trychosis ingratus* (Tschek) (van Rossem, 1966: 37).

Goniocryptus nitidulus, 1896: 2359. Holotype ♀, SWEDEN: Skåne, Degeberga (UZI, Lund).
Labels. Dgb. [hand]; nitidulus [Thomson cabinet label].
Identity. Junior synonym of *Trychosis gradarius* (Tschek) (van Rossem, 1966: 16).

Goniocryptus pictus, 1873: 494. Lectotype ♀, DENMARK: Jutland, Horsens (ZM, Copenhagen), by designation of van Rossem, 1966: 32.
Labels. ♀ 29/5 1870 Horsens O. Jensen [hand]; Danmark ex coll. Schiødte [printed].
Identity. Junior synonym of *Trychosis legator* (Thunberg) (van Rossem, 1966: 24).

Goniocryptus pleuralis, 1896: 2358. Holotype ♀, GERMANY (WEST): Bavaria (UZI, Lund).
Labels. 871 [hand]; 21. [hand]; G. tristator for pleuralis m. [hand] [This last is an original label and is not in Roman's handwriting as suggested by van Rossem (1966: 14)].
Identity. Junior synonym of *Trychosis tristator* (Tschek) (van Rossem, 1966: 12).

Gonotypa melanostoma, 1887*c*: 1137. LECTOTYPE ♀, SWEDEN: Skåne, Lund (UZI, Lund), here designated (selected by H. K. Townes).
Label. L-d [printed].
Identity. *Gonotypus melanostoma* (Thomson).

Grypocentrus apicalis, 1883: 905. Lectotype ♀, SWEDEN: Skåne, Pålsiö [= Pålsjö] (UZI, Lund), by designation of Kasparyan, 1973: 207.
Label. Hbg. [hand].
Identity. *Grypocentrus apicalis* Thomson.

Habrocryptus orbitatorius, 1896: 2364. Holotype ♀, YUGOSLAVIA: Dalmatia (UZI, Lund).
Labels. +129 [hand]; Dalm [hand]; orbitatorius [hand].
Identity. *Ischnus orbitatorius* (Thomson).

Habrocryptus punctiger, 1896: 2364. Lectotype ♀, SWEDEN: Lappland (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 176.
Label. Lpl. [printed].
Identity. *Ischnus punctiger* (Thomson).

Hadrodactylus albicoxa, 1883: 921. Lectotype ♀, SWEDEN: Skåne, Törringe (UZI, Lund), by designation of Idar, 1973: 24.
Labels. Sk [printed]; ♀ [printed]; albicoxa [Thomson cabinet label].
Identity. Junior synonym of *Hadrodactylus confusus* (Holmgren) (Idar, 1973: 24).

Hadrodactylus bidentulus, 1883: 919. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Idar, 1973: 24.

Label. Pål. [hand].
Identity. Hadrodactylus bidentulus Thomson.

Hadrodactylus genalis, 1883: 921. Lectotype ♀, SWEDEN: Skåne, Ortofta (UZI, Lund), by designation of Idar, 1973: 24.
Labels. Ort [hand]; genalis [Thomson cabinet label].
Identity. Hadrodactylus genalis Thomson.

Hadrodactylus gracilipes, 1883: 920. Lectotype ♀, SWEDEN: Skåne, Yddinge (UZI, Lund), by designation of Idar, 1973: 24.
Label. Ydd [hand].
Identity. Hadrodactylus gracilipes Thomson.

Hadrodactylus laticeps, 1883: 920. Lectotype ♀, SWEDEN: Skåne, Ilstorp (UZI, Lund), by designation of Idar, 1973: 24.
Labels. Ilsp 28/7 [hand]; 204. [hand]; ♀ [printed]; laticeps [Thomson cabinet label].
Identity. Junior synonym of *Hadrodactylus tiphae* (Geoffroy).

Hadrodactylus nigrifemur, 1883: 920. Lectotype ♀, SWEDEN: Lappland (UZI, Lund), by designation of Idar, 1974: 113.
Labels. Lap [hand]; nigrifemur [Thomson cabinet label].
Identity. Hadrodactylus nigrifemur Thomson.

Hadrodactylus tarsator, 1883: 919. Lectotype ♀, SWEDEN: Skåne, Yddinge (UZI, Lund), by designation of Idar, 1973: 24.
Label. Yddinge [printed].
Identity. Hadrodactylus tarsator Thomson.

Hadrodactylus villosulus, 1883: 919. Lectotype ♀, SWEDEN: Skåne, Ryssiöholm [= Rössjöholm] (UZI, Lund), by designation of Idar, 1973: 24.
Labels. Rshm 16/6 [hand]; ♀ [printed].
Identity. Hadrodactylus villosulus Thomson.

Hemichneumon fuscipes, 1891: 1612. Holotype ♀, SWEDEN: Oland (UZI, Lund).
Labels.Ö. [printed]; fuscipes m [Thomson cabinet label].
Identity. Hemichneumon fuscipes Thomson.

Hemiteles aeneus, 1884: 982. Lectotype ♀, NORWAY: Hjerkinn (UZI, Lund), by designation of Horstmann, 1979*a*: 297.
Labels. Jerkin. 3.8.77 [locality, printed; date, hand]; 234 [hand]; aeneus [Thomson cabinet label].
Thomson gave the locality as 'Lappland' so it is not absolutely certain that the lectotype is an original specimen. Hjerkinn is not really far enough north to be considered Lappland.
Identity. Junior synonym of *Gelis glacialis* (Holmgren) (Horstmann, 1979*a*: 297).

Hemiteles albipalpus, 1884: 981. Lectotype ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), by designation of Aubert, 1966: 129.
Labels. Rsiö [printed]; albipalpus [Thomson cabinet label].
Identity. Gelis albipalpus (Thomson) (Horstmann, 1979*a*: 297).

Hemiteles alpinus, 1884: 997. Lectotype ♀, SWEDEN: Jämtland, Åreskutan (UZI, Lund), by designation of Jussila, 1965: 160.
Labels. Åre [hand]; Thms [printed].
Identity. Phygadeuon alpinus (Thomson) (Horstmann, 1979*a*: 297).

Hemiteles apertus, 1884: 990. Lectotype ♀, SWEDEN: Öland (UZI, Lund), by designation of Horstmann, 1979*a*: 297.
Label. Ö [hand].
Identity. Junior synonym of *Gnypetomorpha obscura* (Bridgman) (Horstmann, 1979*a*: 297–298).

Hemiteles arcticus, 1884: 998. Syntypes ♀, NORWAY: Skalstugan (lost).
Identity. Phygadeuon arcticus (Thomson) (Horstmann, 1979*a*: 298).

Hemiteles areolaris, 1884: 986. Syntypes ♀, SWEDEN: Skåne, Båstad (lost).
The specimen published as lectotype by Horstmann (1979*a*: 298) is labelled 'Bör' [= Börringe] not 'Bå' and therefore cannot be a syntype.
Identity. Charitopes areolaris (Thomson) (Horstmann, 1979*a*: 298, on the basis of the invalid 'lectotype').

Hemiteles auriculatus, 1884: 977. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Horstmann, 1972: 222.
Label. Pål. [hand].
Identity. Junior synonym of *Zoophthorus graculus* (Gravenhorst) (Horstmann, 1979*a*: 298).

Hemiteles australis, 1885: 26. Type(s) ♀, FRANCE: Avignon (lost).
Identity. Unknown, the name remains a *nomen dubium*.

Hemiteles balteatus, 1885: 28. Syntypes ♀ ♂, FRANCE (lost).
Identity. *Gelis balteatus* (Thomson) (Horstmann, 1979*a*: 298).

Hemiteles bellicornis, 1888*b*: 1243. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Horstmann, 1979*a*: 298.
Label. Pål [hand].
Identity. *Handaoia bellicornis* (Thomson) (Horstmann, 1979*a*: 298).

Hemiteles bidentulus, 1884: 971. Lectotype ♀, SWEDEN: Skåne, Öfvedskloster [= Övedskloster] (UZI, Lund), by designation of Aubert, 1966: 129.
Labels. Öke Å [hand]; bidentulus [Thomson cabinet label].
Identity. Junior synonym of *Isadelphus armatus* (Gravenhorst) (Horstmann, 1979*a*: 298).

Hemiteles breviareolatus, 1884: 995. Lectotype ♀, SWEDEN: Skåne, Stehag (UZI, Lund), by designation of Horstmann, 1979*a*: 298.
Labels. Scan sylv [printed]; breviareolatus [Thomson cabinet label].
Identity. ? *Stibeutes breviareolatus* (Thomson) (Horstmann, 1979*a*: 298).

Hemiteles brevicauda, 1884: 984. Syntype 1 ♂, SWEDEN: Skåne, Löparöd (UZI, Lund).
Label. Löp [hand].

Although Löparöd has not been located, it is difficult to see how the designation as lectotype of a specimen from Ringsjön (Horstmann, 1979*a*: 298) can be justified, especially as an undoubted syntype is present in the collection. However, there is nothing positive to invalidate the lectotype. Its status must remain in doubt until Löparöd is identified.

Identity. *Gelis brevicauda* (Thomson).

Hemiteles capra, 1884: 974. Lectotype ♀, SWEDEN: Skåne, Reften (UZI, Lund), by designation of Aubert, 1972: 148.
Labels. Sk [printed]; Capra [Thomson cabinet label].
Identity. *Mastrulus capra* (Thomson) (Horstmann, 1979*a*: 298).

Hemiteles capreolus, 1884: 970. Lectotype ♀, SWEDEN: Skåne (UZI, Lund), by designation of Horstmann, 1972: 220.
Label. Scan [printed].
Identity. Junior synonym of *Acrolyta rufocincta* (Gravenhorst) (Horstmann, 1979*a*: 298).

Hemiteles clausus, 1888*b*: 1245. Holotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund).
Labels. Ört IX/86 [hand]; n sp [hand].
Identity. *Charitopes clausus* (Thomson) (Horstmann, 1979*a*: 298).

Hemiteles constrictus, 1884: 997. Lectotype ♀, SWEDEN: Skåne, Torekov (UZI, Lund), by designation of Horstmann, 1974*c*: 344.
Label. Trkv [hand].
Identity. *Xiphulcus constrictus* (Thomson) (Horstmann, 1979*a*: 298).

Hemiteles costalis, 1884: 984. Lectotype ♀, SWEDEN: Skåne, Lund, (UZI, Lund), by designation of Horstmann, 1979*a*: 298.
Labels. L-d [printed]; costalis [Thomson cabinet label].
Identity. *Mastrus costalis* (Thomson) (Horstmann, 1979*a*: 298).

Hemiteles cyclogaster, 1884: 992. Type(s) ♀, SWEDEN: Skåne, Ryssiöholm [= Rössjöholm] (lost).
Identity. *Pleurogyrus cyclogaster* (Thomson) (Horstmann, 1979*a*: 298).

Hemiteles cynipinus, 1884: 977. Lectotype ♀, SWEDEN: Skåne (UZI, Lund), by designation of Aubert, 1966: 129.
Labels. Scan [printed]; Cynipinus [Thomson cabinet label].
Identity. *Zoophthorus cynipinus* (Thomson) (Horstmann, 1979*a*: 298).

Hemiteles dispar, 1885: 28. Syntypes ♀ ♂, FRANCE: Libercourt (lost).
Identity. Junior primary homonym of *Hemiteles dispar* Ratzeburg. Replacement name *Hemiteles thomsoni* Schmiedeknecht. The identity of the species is unknown and the name remains a *nomen dubium.*

Hemiteles distans, 1884: 978. Holotype ♀, SWEDEN: Skåne, Klinta (UZI, Lund).
Labels. [small green square]; distans [Thomson cabinet label].
Identity. Clypeoteles distans (Thomson) (Horstmann, 1979*a*: 298).

Hemiteles elymi, 1884: 981. Lectotype ♀, SWEDEN: Skåne, Skanör (UZI, Lund), by designation of Horstmann, 1979*a*: 299.
Labels. Snör [hand]; Elymi [Thomson cabinet label].
Identity. Gelis elymi (Thomson) (Horstmann, 1979*a*: 299).

Hemiteles falcatus, 1884: 999. Lectotype ♀, SWEDEN: Skåne, Fogelsång [= Fågalsång] (UZI, Lund), by designation of Horstmann, 1976*a*: 24.
Label. Fsg [hand].
Identity. Tropistes falcatus (Thomson) (Horstmann, 1979*a*: 299).

Hemiteles fasciatus, 1884: 995. Lectotype ♀, SWEDEN: Skåne, Stehag (UZI, Lund), by designation of Horstmann, 1979*a*: 299.
Label. [small green square].
Identity. Junior primary homonym of *Hemiteles fasciatus* Heer. Replacement name *Theroscopus fasciatulus* Horstmann, 1979*a*: 299.

Hemiteles fumipennis, 1884: 984. Holotype ♀, SWEDEN: Skåne, Lund (UZI, Lund).
Labels. Lund [printed]; fumipennis [Thomson cabinet label].
Identity. Mastrus fumipennis (Thomson) (Horstmann, 1979*a*: 299).

Hemiteles fuscicarpus, 1885: 29. Type(s) ♀, FRANCE: Libercourt (lost).
Identity. Unknown, the name remains a *nomen dubium.*

Hemiteles geniculatus, 1884: 989. Lectotype ♀, SWEDEN: Skåne, Klinta (UZI, Lund), by designation of Aubert, 1966: 129.
Labels. [small green square]; 7 [hand]; geniculatus [Thomson cabinet label].
Identity. Junior synonym of *Dichrogaster aestivalis* (Gravenhorst) (Horstmann, 1979*a*: 299).

Hemiteles gibbifrons, 1884: 980. Holotype ♀, SWEDEN: Småland (UZI, Lund).
Labels. Col Ljgh [printed]; gibbifrons [Thomson cabinet label].
Identity. Gelis gibbifrons (Thomson) (Horstmann, 1979*a*: 299).

Hemiteles glyptonotus, 1885: 32. Type(s) ♀, FRANCE (lost).
Identity. Junior synonym of *Chirotica maculipennis* (Gravenhorst) (Horstmann, 1979*a*: 299).

Hemiteles gracilipes, 1884: 992. Lectotype ♀, SWEDEN: Skåne, Ryssiöholm [= Rössjöholm] (UZI, Lund), by designation of Aubert, 1966: 129.
Labels. Rshm 16/6 [hand]; gracilipes [Thomson cabinet label].
Identity. Oecotelma gracilipes (Thomson) (Horstmann, 1979*a*: 299).

Hemiteles gracilis, 1884: 989. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 138.
Label. Lund [printed].
Identity. Aclastus gracilis (Thomson) (Horstmann, 1979*a*: 299).

Hemiteles hadrocerus, 1884: 991. Lectotype ♀, SWEDEN: Skåne, Esperöd [= Äsperöd] (UZI, Lund), by designation of Horstmann, 1979*a*: 299.
Label. Esp [hand].
Identity. Orthizema hadrocerum (Thomson) (Horstmann, 1979*a*: 299).

Hemiteles hirticeps, 1885: 27. Type(s) ♀, FRANCE: Pyrenees (lost).
Identity. Zoophthorus hirticeps (Thomson) (Horstmann, 1979*a*: 299).

Hemiteles homocerus, 1885: 29. Syntypes ♀ ♂, FRANCE: Libercourt (lost).
Identity. ? Junior synonym of *Sulcarius biannulatus* (Gravenhorst) (Horstmann, 1979*a*: 299).

Hemiteles inflatus, 1884: 992. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Aubert, 1966: 129.
Label. Lund [printed].
Identity. Platyrhabdus inflatus (Thomson) (Horstmann, 1979*a*: 299).

Hemiteles infumatus, 1884: 983. Lectotype ♀, Sweden: Skåne, Lund, Råby (UZI, Lund), by designation of Horstmann, 1979*a*: 299.
Labels. Råb 1/7 [hand]; infumatus [Thomson cabinet label].
Identity. *Gelis infumatus* (Thomson) (Horstmann, 1979*a*: 299).

Hemiteles ischnocerus, 1888*b*: 1246. Lectotype ♀, Sweden: Skåne, Örtofta (UZI, Lund), by designation of Horstmann, 1976*a*: 23.
Label. Ört. 2/VI [hand].
Identity. *Tricholinum ischnocerum* (Thomson) (Horstmann, 1979*a*: 299).

Hemiteles liambus, 1885: 25. Type(s) ♀, France: Avignon (lost).
Identity. Unknown, the name remains a *nomen dubium*.

Hemiteles liostylus, 1885: 30. Syntypes ♀ ♂, France: Libercourt (lost).
Identity. *Dichrogaster liostylus* (Thomson) (Horstmann, 1979*a*: 299).

Hemiteles lissonotoides, 1885: 30. Lectotype ♀, Sweden: Skåne, Pålsjö (UZI, Lund), by designation of Horstmann, 1979*a*: 299.
Labels. Pålsiö [printed]; Lissonotoides m [hand].
Identity. Junior synonym of *Ateleute linearis* Foerster (Horstmann, 1979*a*: 299).

Hemiteles longicauda, 1884: 980. Lectotype ♀, Sweden: Skåne, Pålsiö [Pålsjö] (UZI, Lund), by designation of Aubert, 1966: 129.
Label. Pålsiö [printed].
Identity. *Gelis longicauda* (Thomson) (Horstmann, 1979*a*: 299).

Hemiteles longicaudatus, 1884: 989. Holotype ♀, Sweden: Småland (UZI, Lund).
Label. Sm [hand].
Identity. *Dichrogaster longicaudatus* (Thomson) (Horstmann, 1979*a*: 300).

Hemiteles longulus, 1884: 997. Lectotype ♀, Sweden: Skåne, Lund (UZI, Lund), by designation of Aubert, 1966: 129.
Label. Lund [printed].
Identity. Junior synonym of *Xiphulcus floricolator* (Gravenhorst) (Horstmann, 1979*a*: 300).

Hemiteles macrurus, 1884: 985. Lectotype ♀, Sweden: Skåne, Båstad (UZI, Lund), by designation of Aubert, 1966: 129.
Label. Båst [hand].
Identity. *Charitopes macrurus* (Thomson) (Horstmann, 1979*a*: 300).

Hemiteles magnicornis, 1884: 994. Lectotype ♂, Sweden: Skåne, Yddingesiön [= Yddingesjön] (UZI, Lund), by designation of Horstmann, 1979*a*: 300.
Labels. Yd. [hand]; magnicornis [Thomson cabinet label].
Identity. *Phygadeuon magnicornis* (Thomson) (Horstmann, 1979*a*: 300).

Hemiteles melanogaster, 1884. 982. Lectotype ♀, Sweden: Skåne, Klinta (UZI, Lund), by designation of Jussila, 1965: 155.
Label. Scan [printed].
Identity. *Gelis melanogaster* (Thomson) (Horstmann, 1979*a*: 300).

Hemiteles microstomus, 1884: 969. Lectotype ♀, Sweden: Skåne, Ryssiöholm [= Rössjöholm] (UZI, Lund), by designation of Jussila, 1965: 152.
Labels. Rhm [hand]; microstomus.
Identity. *Zoophthorus microstomus* (Thomson) (Horstmann, 1979*a*: 300).

Hemiteles monodon, 1884: 991. Lectotype ♀, Sweden: Skåne, Yddingesjön (UZI, Lund), by designation of Aubert, 1966: 129.
Labels. [small pale blue-green square]; monodon [Thomson cabinet label].
There is no evidence that the blue-green square indicates that the specimen was collected at Yddingesjön, and if it is later shown to indicate another locality then the lectotype designation will be invalid.
I do not consider the earlier reference by Aubert (1964: 154) to be a valid lectotype designation because he gave no indication of which specimen was selected.
Identity. *Platyrhabdus monodon* (Thomson) (Horstmann, 1979*a*: 300).

Hemiteles nigricornis, 1884: 987. Lectotype ♀, Sweden: Lappland (UZI, Lund), by designation of Horstmann, 1979*a*: 300.
Labels. Lpl. [printed]; nigricornis [Thomson cabinet label].
Identity. *Sulcarius nigricornis* (Thomson) (Horstmann, 1979*a*: 300).

Hemiteles nigriventris, 1884: 975. Lectotype ♀, SWEDEN: Skåne, Vittsjö (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 129.
Labels. Witt 10/6 [hand]; nigriventris [Thomson cabinet label].
Identity. Junior synonym of *Isadelphus gallicola* (Bridgman) (Horstmann, 1979*a*: 300).

Hemiteles notaticrus, 1888*b*: 1244. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Horstmann, 1979*a*: 300.
Labels. Pål [hand]; n. sp [hand]; notaticrus [hand].
Identity. Zoophthorus notaticrus (Thomson) (Horstmann, 1979*a*: 300).

Hemiteles obliquus, 1885: 24. Syntypes ♀♂, FRANCE (lost).
Identity. Unknown, the name remains a *nomen dubium.*

Hemiteles obscuripes, 1884: 976. Lectotype ♀, SWEDEN: Skåne, Pålsiö [= Pålsjö] (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 130.
Labels. Pål. [hand]; obscuripes [Thomson cabinet label].
Identity. Junior synonym of *Isadelphus inimicus* (Gravenhorst) (Horstmann, 1979*a*: 300).

Hemiteles opaculus, 1884: 975. Lectotype ♀, SWEDEN: Skåne, Esperöd [= Äsperöd] (UZI, Lund), by designation of Aubert, 1966: 129.
Label. Col Zet [printed].
Horstmann (1976*a*: 29) casts some doubt on Aubert's designation of this specimen as lectotype. However, in the absence of specimens labelled with the type-locality and in the absence of evidence that the Zetterstedt specimen did not come from Äsperöd it can be accepted as an original specimen.
Identity. Diaglyptellana opacula (Thomson) (Horstmann, 1979*a*: 300).

Hemiteles ornatulus, 1884: 980. Holotype ♀, SWEDEN: Skåne, Kåseberga (UZI, Lund).
Labels. Kås [hand]; ornatulus [Thomson cabinet label].
Identity. Gelis ornatulus (Thomson) (Horstmann, 1979*a*: 300).

Hemiteles pallicarpus, 1884: 970. Lectotype ♀, SWEDEN: Skåne, Reften (UZI, Lund), by designation of Aubert, 1961: 197.
Label. Rfn 12/7 [hand].
Identity. Junior synonym of *Eudelus simillimus* (Taschenberg) (Horstmann, 1979*a*: 300).

Hemiteles plumbeus, 1884: 979. Holotype ♀, SWEDEN: 'Halland' [Skåne], Margretetorp (UZI, Lund).
Label. Marg.
Margretetorp is in northern Skåne, not southern Halland as stated by Thomson. It is near the boundary between the two provinces, so Thomson's error is easily explained.
Identity. Zoophthorus plumbeus (Thomson) (Horstmann, 1979*a*: 300).

Hemiteles punctiventris, 1884: 977. Lectotype ♂, SWEDEN: Skåne, Bökeberg (UZI, Lund), by designation of Horstmann, 1979*a*: 300.
Label. Bök [hand].
Identity. Zoophthorus punctiventris (Thomson) (Horstmann, 1979*a*: 300).

Hemiteles rubricollis, 1884: 979. Holotype ♀, SWEDEN: Skåne, Stehag (UZI, Lund).
Labels. Stehag 28/V 82 in truncus Quercus [hand]; rubricollis [Thomson cabinet label].
Identity. Gelis rubricollis (Thomson) (Horstmann, 1979*a*: 300–301).

Hemiteles rubripes, 1884: 976. Lectotype ♀, SWEDEN: Lappland (UZI, Lund), by designation of Horstmann, 1979*a*: 301.
Labels. Lpl. [printed]; rubripes [Thomson cabinet label].
Identity. Junior synonym of *Isadelphus inimicus* (Gravenhorst) (Horstmann, 1979*a*: 301).

Hemiteles rubrotinctus, 1885: 31. Type(s) ♀, FRANCE: Avignon (lost).
Identity. Chirotica rubrotincta (Thomson) (Horstmann, 1979*a*: 301).

Hemiteles rufulus, 1884: 972. Lectotype ♀, SWEDEN: Skåne, Lund or Pålsiö [= Pålsjö] (UZI, Lund), by designation of Aubert, 1966: 129.
Label. Scan [printed].
Identity. Mastrus rufulus (Thomson) (Horstmann, 1979*a*: 301).

Hemiteles rugifer, 1884: 983. Type(s) ♀, SWEDEN: Norrland (lost).
The specimen recognised as 'holotype' by Horstmann (1979*a*: 301) is from Lillehammer in Norway and therefore cannot be the type. It is labelled 'Norv' and 'Lhmr 24/6 77'. There are no other specimens in the collection.
Identity. Gelis rugifer (Thomson) (Horstmann, 1979*a*: 301, on the basis of the invalid 'holotype').

Hemiteles rugifrons, 1884: 978. Lectotype ♀, SWEDEN: Skåne, Stehag (UZI,Lund), by designation of Horstmann, 1979*a*: 301.

Labels. Rsiö [printed]; rugifrons [Thomson cabinet label].

Identity. Junior synonym of *Clypeoteles distans* (Thomson) (Horstmann, 1979*a*: 301).

Hemiteles scabriculus, 1884: 969. Lectotype ♀, SWEDEN: Skåne, Holmeja (UZI, Lund), by designation of Horstmann, 1979*a*: 301.

Labels. Yd [hand]; scabriculus [Thomson cabinet label].

There is a paralectotype male (? not conspecific) on the same pin, and above, the lectotype.

Identity. Junior synonym of *Eudelus simillimus* (Taschenberg) (Horstmann, 1979*a*: 301).

Hemiteles solutus, 1884: 990. Lectotype ♂, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Aubert, 1966: 129.

Label. Örtofta [printed].

Identity. *Aclastus solutus* (Thomson) (Horstmann, 1979*a*: 301).

Hemiteles stagnalis, 1884: 987. Lectotype ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), by designation of Horstmann, 1976*a*: 26.

Labels. Rsiö [printed]; stagnalis [Thomson cabinet label].

The lectotype is on the same pin as four other specimens (1 ♀, 3 ♂); it is the second from the top.

Identity. Junior synonym of *Agasthenes varitarsus* (Gravenhorst) (Horstmann, 1979*a*: 301).

Hemiteles triannulatus, 1884: 991. Lectotype ♀, SWEDEN: Skåne, Holmeja (UZI, Lund), by designation of Aubert, 1968: 195.

Label. Yddinge [printed].

Identity. *Orthizema triannulatum* (Thomson) (Horstmann, 1979*a*: 301).

Hemiteles trochanteratus, 1884: 994. Syntype 1 ♂, SWEDEN: Skåne, Örtofta (UZI, Lund).

Label. Örtofta [printed].

Despite Horstmann's view (1979*a*: 301) this male specimen cannot be excluded from Thomson's type-series and must be a syntype. Thomson expressly *included* the male (*Code*, Article 72(b)) even though his description may not apply to it.

Identity. *Theroscopus trochanteratus* (Thomson).

Hemiteles trochanteratus, 1885: 26. ? Syntype 1 ♂, FRANCE (UZI, Lund).

Label. Gallia [hand].

It is possible, perhaps probable, that this is a specimen sent by Lethierry to Thomson after 1885 and therefore not a type.

Identity. Junior primary homonym of *Hemiteles trochanteratus* Thomson, 1884. Replacement name *Hemiteles trochanteralis* Dalla Torre, 1902: 668. ? *Theroscopus trochanteralis* (Dalla Torre) **comb. n.**

Hemiteles ungularis, 1884: 994. Lectotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Horstmann, 1979*a*: 301.

Labels. Ört. [hand]; ungularis [Thomson cabinet label].

Identity. *Theroscopus ungularis* (Thomson) (Horstmann, 1979*a*: 301).

Hemiteles unicolor, 1884: 974. Lectotype ♀, SWEDEN: Öland (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 137.

Labels. Ö. [printed]; unicolor [Thomson cabinet label].

The lectotype is the lower of two specimens on one pin.

Identity. Junior synonym of *Hemiteles similis* (Gmelin) (Horstmann, 1979*a*: 301).

Hemiteles validicornis, 1884: 995. Lectotype ♀, SWEDEN: Norrland (UZI, Lund), by designation of Aubert, 1972: 148.

Labels. Norl. [printed]; validicornis [Thomson cabinet label].

Identity. Junior synonym of *Theroscopus melanopygus* (Gravenhorst) (Horstmann, 1979*a*: 301).

Hodostatus brevis, 1883: 929. LECTOTYPE ♀, SWEDEN: Skåne, Lund (UZI, Lund), here designated (selected by H. K. Townes).

Labels. LD 4/8. ['LD' printed, date hand]; brevis [Thomson cabinet label].

Identity. *Hodostates brevis* (Thomson).

Holocremna annulitarsis, 1887*c*: 1179. Syntypes 1 ♀, 1 ♂, 2 ? sex, SWEDEN: Skåne, Ringsjön (UZI, Lund).

Labels. [small green square] (1 ♂, 2 ? sex). [small green square]; ♀ [printed] (1 ♀).

Aubert's publication of a neotype (1966: 131) for this species is, fortunately, not valid because it does

not comply with the provisions of Article 75(*c*) of the *Code*. The discovery of syntypes does not, therefore, need a reference to the Commission (Article 75(*f*)).
Identity. Olesicampe annulitarsis (Thomson) **comb. n.**

Holocremna bergmanni, 1887*c*: 1182. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Aubert, 1972: 149.
Labels. Lund [printed]; Bergmañi [Thomson cabinet label].
Identity. Olesicampe bergmanni (Thomson) **comb. n.**

Holocremna buccata, 1887*c*: 1180. LECTOTYPE ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), here designated (selected by R. Hinz).
Labels. Hbg [hand]; ♀ [printed].
Identity. Olesicampe buccata (Thomson) (det. R. Hinz) **comb. n.**

Holocremna curtigena, 1887*c*: 1179. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1966: 131.
Labels. Pål. [hand]; curtigena [Thomson cabinet label].
The lectotype is the upper of two specimens on the same pin.
Identity. Olesicampe curtigena (Thomson) **comb. n.**

Holocremna frutetorum, 1887*c*: 1178. Lectotype ♀, GERMANY (EAST): Dresden (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 302.
Labels. Dresden [hand]; frutetorum m [hand].
Identity. Olesicampe frutetorum (Thomson).

Holocremna heterogaster, 1887*c*: 1178. Lectotype ♀, GERMANY (UZI, Lund), by designation of Aubert, 1972: 150.
Label. f. 3. 84. [hand].
Identity. Olesicampe heterogaster (Thomson) **comb. n.**

Holocremna melanogaster, 1887*c*: 1181. LECTOTYPE ♀, SWEDEN: Skåne; Pålsjö (UZI, Lund), here designated (selected by R. Hinz).
Labels. Hbg [hand]; ♀ [printed]; melanogaster [Thomson cabinet label].
Identity. Olesicampe melanogaster (Thomson) **comb. n.**

Holocremna sinuata, 1887*c*: 1180. Type(s) ♀, SWEDEN: Skåne, Ringsjön (lost).
The specimen labelled and published by Aubert (1966: 131) as lectotype is from Örtofta [label 'Ört'], not Ringsjön, and is not a type. The lectotype designation is therefore invalid.
Identity. Olesicampe sinuata (Thomson) **comb. n.** (on the basis of material in the collection).

Holocremna spireae, 1887*c*: 1182. Holotype ♀, GERMANY (WEST): Munich (UZI, Lund).
Labels. 1. [hand]; Spireae [Thomson cabinet label].
Identity. Olesicampe spireae (Thomson) **comb. n.**

Holocremna tarsator, 1887*c*: 1180. LECTOTYPE ♀, GERMANY (UZI, Lund), here designated (selected by R. Hinz).
No labels.
Identity. Olesicampe tarsator (Thomson) **comb. n.**

Homoporus brevicornis, 1890: 1507. Syntype 1 ♀, FRANCE: Lille (UZI, Lund).
Labels. St. Germ. de Princay. [hand]; brevicornis m (Thomson cabinet label].
Identity. Junior synonym of *Syrphoctonus crassicornis* (Thomson). Thomson published the two names *Homoporus crassicornis* (see below) and *H. brevicornis* simultaneously for the same species. The former name was used in the key (page 1490) and the latter with the description (page 1507). Stelfox (1941: 117) made a first reviser choice between the two names. The female noted above is the only surviving syntype of both nominal species.

Homoporus brevitarsis, 1890: 1489, 1495. Lectotype ♂ [not ♀ as stated by Aubert, 1966: 128], SWITZERLAND: Chur (UZI, Lund), by designation of Aubert, 1966: 128.
Labels. Chur [printed]; Suisse. [hand].
Identity. Daschia brevitarsis (Thomson).

Homoporus caudatus, 1890: 1490, 1499. Syntypes 5 ♀, 1 ♂, SWEDEN: Skåne, Ringsjön and FRANCE: near Lille (UZI, Lund).
Labels. [small green square]; ♀ [printed]; caudatus m. [Thomson cabinet label] (1 ♀). Phalempin

[hand] (1 ♀). Libercourt. [hand]; Gall [hand] (2 ♀). Fives. [hand, ?some letters]; Gall [hand] (1 ♀). Lille. [hand]; Gall [hand] (1 ♂).
Identity. Campocraspedon caudatus (Thomson).

Homoporus crassicornis, 1890: 1490. Syntype 1 ♀, FRANCE: Lille (UZI, Lund).
Labels. St. Germ. de Princay. [hand]; brevicornis m [Thomson cabinet label].
Identity. Syrphoctonus crassicornis (Thomson) **comb. n.** See notes under *Homoporus brevicornis* above.

Homoporus crassicrus, 1890: 1491, 1516. Lectotype ♀, SWEDEN: Öland (UZI, Lund), by designation of Jussila, 1966: 319.
Labels. Ö. [printed]; crassicrus m [Thomson cabinet label].
The lectotype is on the same pin as another specimen (a tryphonine).
Identity. Syrphoctonus crassicrus (Thomson).

Homoporus hygrobius, 1890: 1491, 1524. Syntypes 6 ♀, 5 ♂, SWEDEN: Skåne (UZI, Lund).
Labels. Lund [printed]; hygrobius m [Thomson cabinet label] (1 ♀). Lund [printed] (1 ♀ 1 ♂ on one pin). Ört. [hand] (3 ♂). Ld [hand] (1 ♀). [green square] (1 ♀). Bör [hand]; ♀ [printed] (1 ♀). Bök 9/76 [hand] (1 ♀). Bö [illegible letters] 7/88 [hand] (1 ♂).
Identity. Junior synonym of *Syrphoctonus signatus* (Gravenhorst) (Carlson, 1979: 718).

Homoporus incisus, 1890: 1511. Holotype ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund).
Labels. Ringsiö [printed]; incisus m [Thomson cabinet label].
Identity. Syrphoctonus incisus (Thomson) **comb. n.**

Homoporus longiventris, 1890: 1491, 1514. Lectotype ♀, SWEDEN: Skåne, Pälsjö (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 404.
Labels. Päl. [hand]; longiventris m [Thomson cabinet label].
Identity. Syrphoctonus longiventris (Thomson).

Homoporus megaspis, 1890: 1491, 1516. Holotype ♀, GERMANY (WEST): Bavaria (ZSBS, Munich).
Labels. Rsh. Hst. 11.9.73. A.Krchb. [hand]; 1 185. [hand]; ex. typ. [hand]; B. megaspis m ♀ [hand].
Identity. Syrphoctonus megaspis (Thomson) **comb. n.**

Homoporus nigricornis, 1890: 1490, 1506. Holotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund).
Labels. Hbg. [hand]; nigricornis n [Thomson cabinet label].
Identity. Enizemum nigricornis (Thomson).

Homoporus punctiventris, 1890: 1490, 1500. Type(s) ♀, DENMARK: Zealand, Strandmøllen (lost).
In the collection of the Zoological Museum, Copenhagen there is a label 'Punctiventris Thoms. Origin. Type ♂ ♀' but there are no specimens which could be types. Also, there are no specimens from the type-locality in the Thomson collection despite the indication by Dasch (1964: 267) and the statement by Beirne (1941: 683) that Perkins had compared a specimen with the type.
Identity. Sussaba punctiventris (Thomson) (on the basis of material in the Thomson collection).

Homoporus xanthaspis, 1890: 1491, 1518. Syntypes 1 ♀, 1 ♂, DENMARK: Zealand, Strandmøllen (ZM, Copenhagen).
Labels. ♀ Strandm. Drewsen [hand]; Danmark ex coll. Schiødte [printed] (♀). ♂ Strandm. Drewsen [hand]; Danmark ex coll. Schiødte [printed] (♂).
Identity. Phthorima xanthaspis (Thomson) **comb. n.**

Hoplocryptus binotatulus [as 2-*notatulus*], 1873: 512. LECTOTYPE ♀, SWEDEN: Småland (UZI, Lund), here designated (selected by H. K. Townes).
Labels. [pink square]; Smol [printed].
Identity. Junior synonym of *Aritranis fugitivus* (Gravenhorst) (Townes & Townes, 1962: 99).

Hoplocryptus elegans, 1873: 511. Syntypes 1 ♀, 1 ♂, SWEDEN: Skåne, Reften (UZI, Lund).
Labels. Rfn 5/7 [hand] (♀). Rfn 7/7 [hand] (♂).
Thomson (1896: 2371) synonymised this species with *Hoplocryptus confector* (Gravenhorst) and the syntypes stand in his collection under the name *confector* in a series beginning with a specimen bearing Thomson's cabinet label '*elegans*'.
Identity. Aritranis elegans (Thomson) **comb. n.**

Hoplocryptus (Aritranis) graefei [as *gräfei*], 1896: 2373. Syntypes 2 ♀, 1 ♂, ITALY: Trieste (UZI, Lund).
Labels. Aüs Rubus St. Triest. ['Triest.' printed, remainder hand]; Hoplocryptus graefei typer [hand] (1 ♀). 2.VI Triest. Zaüle Wiesen. ['Triest.' printed, remainder hand]; (1 ♀). Aüs Rubus Stengel gezogen. Triest. ['Triest.' printed, remainder hand] (1 ♂).
Identity. Aritranis graefei (Thomson) **comb. n.**

Hoplocryptus mesoxanthus, 1873: 509. Syntypes 3 ♀, 1 ♂, Sweden: Skåne, Öland and Småland (UZI, Lund).
Labels. 1190 [hand]; Scan [printed]; mesoxanthus [Thomson cabinet label] (1 ♀). Col Ljgh [printed] (2 ♀). [small dark blue square] (1 ♂).
Identity. Aritranis mesoxanthus (Thomson) **comb. n.**

Hoplocryptus pulcher, 1873: 509. Syntypes 3 ♀, 6 ♂, Sweden: Skåne, Lund and Ilstorp (UZI, Lund).
Labels. Ilsp 13/8 [hand]; pulcher [Thomson cabinet label] (1 ♀). Ilsp 13/7 [hand] (1 ♀). Ilsp 7/8 [hand] (1 ♀). Ilsp 18/7 [hand] (1 ♂). Ilsp 5/7 [hand] (1 ♂). Ilsp 30/7 (1 ♂), Ld [hand] (3 ♂).
Identity. Aritranis pulcher (Thomson) **comb. n.**

Hygrocryptus (Hygrocryptus) brevispina, 1896: 2377. Holotype ♂, Italy: Trieste (UZI, Lund).
Labels. 6.VIII Triest. ['Triest.' printed, date hand]; brevispina m [Thomson cabinet label].
Identity. Thrybius brevispina (Thomson) **comb. n.**

Hygrocryptus drewseni, 1873: 514. Syntypes 4 ♀, 3 ♂, Denmark: Zealand, Leersö (ZM, Copenhagen).
Labels. ♀ 7/1870 Lersó Drewsen [hand]; Danmark ex coll. Schiødte [printed] (1 ♀). Danmark ex coll. Schiødte [printed] (3 ♀ 2 ♂). ♂ 7/1870 Lersó Drewsen [hand]; Danmark ex coll. Schiødte [printed] (1 ♂).
Identity. Junior synonym of *Thrybius leucopygus* (Gravenhorst) (Kerrich, 1938: 174).

Hygrocryptus palustris, 1873: 514. Syntypes 2 ♀, Sweden: Skåne, Alnarp (UZI, Lund).
Labels. palustris [Thomson cabinet label] (1 ♀). Alnp 8/57 [hand] (1 ♀).

In addition to the two syntypes in Lund there are six females in the collection of the Zoological Museum, Copenhagen; some or all of which might be Danish specimens (syntypes) mentioned by Thomson. However, because of the existence of syntypes in Lund and some doubt that the Danish specimens are the ones mentioned by Thomson they are not positively included in the syntype series here recognised.
Identity. Gambrus palustris (Thomson) **comb. n.**

Icheumon (Ichneumon) acuticornis, 1896: 2396. Holotype ♀, Sweden: Göteborg (UZI, Lund).
Labels. [blue square]; Gbg. [hand]; acuticornis m [Thomson cabinet label].
Identity. Ichneumon acuticornis Thomson.

Ichneumon aequicalcar, 1888*b*: 1231. Holotype ♀, Sweden: Jemtland [= Jämtland], Åreskutan (UZI, Lund).
Labels. Lpl. [printed]; Ths [printed]; aequicalcar [Thomson cabinet label].
Identity. Ichneumon aequicalcar Thomson.

Ichneumon (Cratichneumon) albiscuta, 1893: 1946. Syntypes 1 ♀, 2 ♂, Sweden: Gottland [= Gotland] and France (UZI, Lund),
Labels. Gotl. [hand]; Col. Hgn. [printed]; albiscuta [Thomson cabinet label] (1 ♀). Gotl. [hand]; Col. Hgn. [printed] (1 ♂). 2. [hand]; Gall [hand]; 6-armillatus Krchb [hand] (1 ♂).
Identity. Cratichneumon albiscuta (Thomson).

Ichneumon (Ichneumon) anospilus, 1886*b*: 15. Syntype 1 ♀, ? syntype 1 ♀, Sweden: Småland and [?] Skåne (UZI, Lund).
Labels. Smoland [printed]; anospilus [Thomson cabinet label] (syntype). Scan [handL; Col. Hgn. [printed] (? syntype).

Thomson gave only 'Suecia australis' as the locality in the original description but later (1893: 1911) he stated 'Funnen i Småland'. The Skåne specimen may therefore postdate 1893 and if so cannot be a syntype.
Identity. Coelichneumon anospilus (Thomson) **comb. n.**

Ichneumon (Cratichneumon) anotylus, 1896: 2403. Holotype ♀, Sweden: Skåne (UZI, Lund).
Label. Scania [hand].
Identity. Cratichneumon anotylus (Thomson) **comb. n.**

Ichneumon (Ichneumon) arctobius, 1896: 2399. ? Holotype ♀, Sweden (UZI, Lund).
Labels. Hlm [printed]; Rudolphi [hand]; arctobius m [Thomson cabinet label].

The specimen tentatively regarded as holotype is the only one in the collection under this name. It is a Rudolphi specimen from the Stockholm area (label 'Hlm'). Most Rudolphi material comes from Hälsingland (part of 'Norrland') and Thomson may have misread 'Hlm' as 'Hls'. It is perhaps significant that the preceding species, in both the collection and the publication, *I. monospilus* is also from 'Norrland' and its holotype is a Rudolphi specimen from Hälsingland (see below).
Identity. Ichneumon arctobius Thomson.

Ichneumon (Ichneumon) boreellus, 1896: 2396. Syntypes 2 ♀, Sweden: 'Norrland', Hälsingland (UZI, Lund).
Labels. 3. [hand]; Norl [printed]; boreellus m [Thomson cabinet label] (1 ♀). Hls [printed]; Rui [hand] [= Rudolphi]; No. 5 n sp [hand] (1 ♀).
Identity. Ichneumon boreellus Thomson.

Ichneumon (Ichneumon) brevigena, 1886*b*: 19. Syntypes 2 ♀, GERMANY (WEST): Birkenfeld (UZI, Lund).
Labels. Birkenfeld [hand]; 4. [hand]; Brevigena [Thomson cabinet label] (1 ♀). Birkenfeld Tischbein [hand] (1 ♀).
Identity. Junior synonym of *Ichneumon inquinatus* Wesmael (Perkins, 1953: 113).

Ichneumon (Ichneumon) captorius, 1887*a*: 7. Syntypes [? number, see notes below] ♀ ♂, SWEDEN (UZI, Lund).
The series of specimens representing this species in the collection has been combined with that of *I. xanthognathus* (see below). The labels 'captorius' and 'xanthognathus' are placed together and 12 ♀ and 11 ♂ represent both species. One of the females is lectotype of *I. xanthognathus.* A lectotype for *I. captorius* needs to be selected carefully from the remaining specimens, which are all eligible in terms of type-locality. It is not considered worthwhile to attempt to delimit the syntype series of *captorius.* Perkins' (1953: 114) mention of 9 ♀ and 2 ♂ syntypes may have been the result of such an attempt but this is not clear.
Identity. Junior synonym of *Ichneumon minutorius* Desvignes (Perkins, 1953: 113).

Ichneumon (Ichneumon) chrysostomus, 1896: 2400. Holotype ♀, SWEDEN: Jemtland [= Jämtland] (UZI, Lund).
Labels. Jtl [printed]; No 5 [hand]; chrysostomus m [Thomson cabinet label].
Identity. Ichneumon chrysostomus Thomson.

Ichneumon (Coelichneumon) coactus, 1893: 1908. Syntypes 1 ♀, 1 ♂, SWEDEN: Skåne, Ringsjön (UZI, Lund).
Labels. Ringsiö [printed]; breviscuta m [Thomson cabinet label] (♀). Ringsiö Uprinted] (♂).
Identity. Coelichneumon coactus (Thomson).

Ichneumon corfitzi, 1890: 1530. LECTOTYPE ♀, SWEDEN: Skåne, Stehag (UZI, Lund), here designated (selected by R. Hinz).
Label. Shg. Haslsm vii.88 CM [hand].
Identity. Ichneumon corfitzi Thomson.

Ichneumon (Ichneumon) crassifemur, 1886*b*: 18. Lectotype ♀, GERMANY (WEST): Aachen (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 463.
Labels. 10/496 ['10' hand, '496' printed]; Aachen [printed].
Identity. Ichneumon crassifemur Thomson.

Ichneumon (Ichneumon) crassitarsis, 1893: 1925. LECTOTYPE ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), here designated (selected by R. Hinz).
Label. Ringsiö [printed].
Identity. Ichneumon crassitarsis Thomson.

Ichneumon (Ichneumon) decrescens, 1886*b*: 13. Syntypes 1 ♀, 2 ♂, SWEDEN: Skåne and Kalmar (UZI, Lund).
Labels. Calmar [printed]; decrescens [Thomson cabinet label] (1 ♀). Scania [printed] (1 ♂). Col. Hgn. [printed] (1 ♂).
Identity. Coelichneumon decrescens (Thomson).

Ichneumon eurycerus, 1890: 1528. Lectotype ♀, SWEDEN: Skåne, Stehag (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 465.
Labels. Rsiö [printed]; Eurycerus [Thomson cabinet label].
A second lectotype designation (for a different specimen and invalid) was published by Aubert (1966: 128).
Identity. Ichneumon eurycerus Thomson.

Ichneumon (Ichneumon) gibbulus, 1886*b*: 21. Syntypes 1 ♀, 1 ♂, SWEDEN: Skåne (UZI, Lund).
Labels. Scan occi [printed]; gibbulus Ths. [Thomson cabinet label] (♀). Scan occi [printed] (♂).
Identity. Ichneumon gibbulus Thomson.

Ichneumon (Ichneumon) grandiceps, 1887*a*: 13. Holotype ♀, SWEDEN: Skåne, Fågelsång (UZI, Lund).
Labels. Fogelsång 2 Jl 35 [hand]; grandiceps [Thomson cabinet label].
Thomson gave the locality as only 'Suecia australis' in the original description but later (1893: 1953) gave more details.
Identity. Cratichneumon grandiceps (Thomson) **comb. n.**

Ichneumon (Ichneumon) grandicornis, 1886*b*: 24. LECTOTYPE ♀, SWEDEN: Lappland (UZI, Lund), here designated (selected by G. H. Heinrich).
Label. Norrl. [printed].
Identity. Ichneumon grandicornis Thomson.

Ichneumon hypolius, 1888*b*: 1226. Holotype ♀, SWEDEN: Norrland, Hälsingland (UZI, Lund).
Labels. Hels Ri [hand]; [small gold square] [= G. F. Möller]; hypolius [Thomson cabinet label].
Identity. Ichneumon hypolius Thomson.

Ichneumon (Ichneumon) jesperi, 1893: 1925. LECTOTYPE ♀, SWEDEN: Skåne, Stehag (UZI, Lund), here designated.
Label. Shg. Haslsm vii.88 CM [hand].
The lectotype is also the lectotype of *Ichneumon corfitzi* Thomson. Thomson (1894: 2080) says that he needs to correct a few wrong names, that number 29 [1893: 1925 *I. jesperi*] should be *corfitzi* and that number 79 should be *melanopygus*. It is clear therefore that *jesperi* is an error for *corfitzi* and should have the same type-specimen.
Identity. Junior objective synonym of *Ichneumon corfitzi* Thomson.

Ichneumon leucopeltis, 1888*b*: 1230. Holotype ♀, SWEDEN: Jemtland [= Jämtland] (UZI, Lund).
Label. Jtl [printed].
Identity. Ichneumon leucopeltis Thomson.

Ichneumon liocnemis, 1888*b*: 1220. Syntypes 1 ♀, 2 ♂, SWEDEN: Götheborg [= Göteborg] and Stockholm area (UZI, Lund).
Labels. Gbg [hand] (2 ♂). Hlm [printed]; P.Wg. [printed]; Col. Hgn. [printed] (1 ♀).
Identity. Coelichneumon liocnemis (Thomson).

Ichneumon (Ichneumon) liostylus, 1887*a*: 12. Syntypes 2 ♀, 3 ♂, SWEDEN: Skåne, Pålsjö and Degeberga (UZI, Lund).
Labels. Hbg. [hand]; liostylus [Thomson cabinet label] (1 ♀). Degeberga [printed] (1 ♀). Pål. [hand] (2 ♂). Hbg. [hand] (1 ♂).
It is possible that the males are not syntypes (see Thomson, 1893: 1950).
Identity. Cratichneumon liostylus (Thomson).

Ichneumon (Ichneumon) longeareolatus, 1886*b*: 21. Lectotype ♀, SWEDEN: Skåne (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 471.
Label. Sc. [hand].
Identity. Ichneumon longeareolatus Thomson.

Ichneumon (Ichneumon) macrocerus, 1886*b*: 20. Syntypes 4 ♀, 6 ♂, SWEDEN: Skåne, Ringsjön, Pålsjö, Reften and Fågelsång and GERMANY (UZI, Lund).
No notes were made of individual specimen labels.
Identity. Ichneumon macrocerus Thomson.

Ichneumon (Ichneumon) mesostilpnus, 1888*a*: 107. Holotype ♀, GERMANY (WEST): Aachen (UZI, Lund).
Labels. 8/525 ['8' hand, '525' printed]; AACHEN Aug. 75 [printed]; Tb [printed]; Ichneumon albosignatus Grv. ♀ [hand]; mesostilpnus Th [Thomson cabinet label].
Identity. Barichneumon mesostilpnus (Thomson) **comb. n.**

Ichneumon (Ichneumon) micropnygus, 1893: 1927. Replacement name for *Ichneumon* (*Ichneumon*) *spiracularis* Thomson (see below), junior primary homonym of *Ichneumon spiracularis* Tischbein.

Ichneumon (Ichneumon) monospilus, 1896: 2398. Holotype ♀, SWEDEN: Hälsingland (UZI, Lund).
Labels. Hls [printed]; Rud [hand]; gravipes [hand]; Frei? [hand]; monospilus m [Thomson cabinet label].
Identity. Ichneumon monospilus Thomson.

Ichneumon (Ichneumon) nereni [as *neréni*], 1887*a*: 8. Lectotype ♀, SWEDEN: Skåne (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 474.
Labels. Scan occi [printed]; Nereni [Thomson cabinet label].
Identity. Ichneumon nereni Thomson.

Ichneumon (Ichneumon) nordenstromi [as *nordenströmi*], 1896: 2399. Holotype ♀, NORWAY: Dovre (UZI, Lund).
Labels. 33. [hand]; Dovre Nord-ström [hand]; Nordenströmi m [Thomson cabinet label].
Identity. Ichneumon nordenstromi Thomson.

Ichneumon (Ichneumon) nudicoxa, 1888*a*: 107. Syntypes 2 ♀, 2 ♂, SWEDEN: Stockholm area and Skåne, Åsperöd (UZI, Lund).
Labels. Esp. [hand] (1 ♀). Col. Hgn. [printed] (1 ♀). Holm [printed]; Col. Hgn. [printed] (2 ♂).

Although Thomson only gave 'Suecia' as the locality in the original description, he later (1893: 1958) gave more details: 'funnen vid Torekov och Esperöd i Skåne'. The three syntypes originating from the Holmgren collection are considered to be the specimens of *albosignatus* sensu Holmgren. Two other specimens in the collection are not considered to be syntypes.

Identity. Junior synonym of *Barichneumon digrammus* (Gravenhorst) (Perkins, 1953: 135).

Ichneumon (Ichneumon) pallitarsis, 1887*a*: 11. Syntypes 11 ♀, 3 ♂, SWEDEN (UZI, Lund).

No notes were made of individual specimen labels. The syntype series includes specimens from the following localities: Skåne, Torekov (label 'Tkov'); Lappland (label 'Lpl'); and Norrland (label 'Norl').

Identity. Cratichneumon pallitarsis (Thomson).

Ichneumon (Cratichneumon) parviscopa, 1893: 1950. Syntypes 1 ♀, 5 ♂, SWEDEN: Skåne, Ringsjön (♂♂ only) (UZI, Lund).

Labels. [green square] (5 ♂). Col. Hgn. [printed] (1 ♀).

The female specimen originating from the Holmgren collection is assumed to be *nigritarius* sensu Holmgren. It does not have a locality.

Identity. Cratichneumon parviscopa (Thomson) **comb. n.**

Ichneumon (Ichneumon) quadriannellatus, 1893: 1929. Unjustified emendation of *Ichneumon* (*Ichneumon*) *quadriannulatus* Thomson, 1887*a* (see entry below).

Ichneumon (Ichneumon) quadriannulatus, 1887*a*: 10. Syntype 1 ♀, SWEDEN: Lappland (UZI, Lund).

Label. Norrl. [hand].

Identity. Junior primary homonym of *Ichneumon quadriannulatus* Gravenhorst, 1829*a*. Thomson (1893: 1929) changed the name to *quadriannellatus* and maintained this change when he referred to the species for a third time (1896: 2395). However, in neither of these subsequent references did Thomson mention the homonymy or the original spelling. The name *quadriannellatus* is therefore probably best treated as an unjustified emendation rather than a replacement name or incorrect subsequent spelling. As such it is a junior objective synonym of *I. quadriannulatus* Thomson and has the same type. It is the oldest available name for this species, which belongs in the genus *Ichneumon*.

Ichneumon (Ichneumon) quinquenotatus [as *5-notatus*], 1893: 1936. Syntypes 1 ♀, 1 ♂, SWEDEN: Uppland and Skåne, Ringsjön (UZI, Lund).

Labels. Col. Hgn. [printed]; 5-notatus Ths. [Thomson cabinet label] (♀). [green square] (♂).

Identity. Ichneumon quinquenotatus Thomson. Dalla Torre (1902: 977) gives an erroneous reference to an earlier publication by Tischbein of the same name. Tischbein did not describe an *Ichneumon quinquenotatus*.

Ichneumon (Ichneumon) simulosus, 1886*b*: 16. Syntype 1 ♀, SWEDEN: Skåne, Ramlösa (UZI, Lund).

Labels. Hbg. [hand]; simulosus [the first letter could be 's' or 'r'] [Thomson cabinet label].

Thomson gave only 'Suecia australi' as the locality in the original description but later (1893: 1966) he stated 'Funnen i båda könen vid Ramlösa'. A male specimen (from Pålsjö) in the collection probably post-dates 1893 and is not therefore regarded as a syntype.

In the 1893 reference to the species Thomson altered the spelling of the name to *rimulosus*. This spelling has been widely used since, but it is incorrect.

Identity. Stenichneumon simulosus (Thomson).

Ichneumon (Ichneumon) spiracularis, 1886*b*: 22. Holotype ♀, SWEDEN: Norrland (UZI, Lund).

Labels. Norl. [printed]; spiracularis [Thomson cabinet label].

Identity. Junior primary homonym of *Ichneumon spiracularis* Tischbein. Replacement name *Ichneumon* (*Ichneumon*) *micropnygus* Thomson (see above). The species belongs in the genus *Ichneumon*.

Ichneumon (Ichneumon) stenocarus, 1887*a*: 13. Lectotype ♀, SWEDEN: Skåne, [? Äsperöd] (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 446.

Labels. 29 Äsperöd [hand, not clear, could easily be '29 Aug .....']; stenocarus [Thomson cabinet label].

Identity. Cratichneumon stenocarus (Thomson).

Ichneumon (Ichneumon) stenocerus, 1887*a*: 7. Syntypes 6 ♀, SWEDEN: Göteborg, Skåne, Ringsjö and ? Skåne, Hässleholm (UZI, Lund).

Labels. Gbg [hand]; Stenocerus [Thomson cabinet label] (1 ♀). Ringsiö [printed] (1 ♀). Scania [printed] (2 ♀). Scan med [printed] (1 ♀). Hhm [hand, ? individual letters] [? = Hässleholm] (1 ♀).

Identity. Ichneumon stenocerus Thomson.

Ichneumon (Ichneumon) subquadratus, 1887*a*: 9. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 481.
Labels. Pål [hand]; subquadratus [Thomson cabinet label].
Identity. Ichneumon subquadratus Thomson.

Ichneumon (Coelichneumon) tenuitarsis, 1893: 1907. Holotype ♀, SWEDEN: ? Östergötland (UZI, Lund).
Labels. [small blue square]; Col. Hgn. [printed]; tenuitarsis [Thomson cabinet label].
Thomson expressed doubt about the locality, presumably he was guessing at the meaning of the blue square.
Identity. Coelichneumon tenuitarsis (Thomson) **comb. n.**

Ichneumon trispilus [as *3-spilus*], 1888*b*: 1228. Syntypes 6 ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund).
Labels. Pål. [hand]; trispilus [Thomson cabinet label] (1 ♀). Pål [hand] (5 ♀).
Identity. Ichneumon trispilus Thomson.

Ichneumon (Ichneumon) truncatulus, 1886*b*: 15. Syntypes 1 ♀, 1 ♂, SWEDEN: Skåne, Reften (UZI, Lund).
Labels. Rfn 27/6 [hand]; truncatulus [Thomson cabinet label] (♂). Rfn 10/7 [hand] (♀).
Thomson gave only 'Suecia australi' as the locality in the original description but later (1893: 1911) he stated 'Funnen vid Reften nära Lund'. Specimens in the collection from other localities probably postdate 1893 and therefore cannot be syntypes.
Identity. Coelichneumon truncatulus (Thomson).

Ichneumon (Eupalamus) wesmaeli, 1886*b*: 12. Lectotype ♀, SWEDEN: Skåne, Lindholmen (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 448.
Label. Lhn 8/8 [hand].
Townes, Momoi & Townes (1965: 448) gave the original combination incorrectly as *Eupalamus wesmaeli.*
Identity. Eupalamus wesmaeli (Thomson).

Ichneumon (Ichneumon) xanthognathus, 1887*a*: 8. Lectotype ♀, SWEDEN: Skåne, Rönnemölla (UZI, Lund), by designation of Aubert, 1966: 128.
Label. Rön [hand].
Identity. Ichneumon xanthognathus Thomson.

Ischnus (Ischnus) coxator, 1891: 1624. LECTOTYPE ♂, SWITZERLAND: Zermatt (UZI, Lund), here designated (selected by J. F. Aubert).
Labels. Zermatt [hand]; coxator [hand].
Identity. Heterischnus coxator (Thomson) **comb. n.**

Ischnus (Ischnus) pulchellus, 1891: 1625. Syntypes 1 ♀, 1 ♂, YUGOSLAVIA: Dalmatia (♂) and [?] (♀) (UZI, Lund).
Labels. +158 [hand]; Dalm. [printed] (♂). +139 [hand]; Buss [printed, ? a locality]; pulchellus m [Thomson cabinet label] (♀).
Identity. Heterischnus pulchellus (Thomson) **comb. n.**

Lathrolestus caudatus, 1883: 917. Type(s) ♀ [and ? ♂], SWEDEN: Norrland (lost).
Identity. Lathrolestes caudatus (Thomson) (on the basis of a specimen in the collection).

Lathrolestus luteolus, 1883: 917. Holotype ♂, SWEDEN: Skåne, Lund (UZI, Lund).
Label. L-d [printed].
Identity. Lathrolestes luteolus (Thomson).

Lathrolestus marginatus, 1883: 917. Lectotype ♀, SWEDEN: Skåne, Fogelsång [= Fågelsång] (UZI, Lund), by designation of Aubert, 1972: 147.
Labels. Sk. [hand]; marginatus [Thomson cabinet label].
Identity. Lathrolestes marginatus (Thomson).

Lathrolestus pleuralis, 1883: 916. LECTOTYPE ♀, SWEDEN: Norrland (UZI, Lund), here designated (selected by R. Hinz).
Labels. 238 [hand]; Norr [hand]; pleuralis [Thomson cabinet label].
Identity. Lathrolestes pleuralis (Thomson).

Lathrolestus ungularis, 1883: 918. Syntype 1 ♀, SWEDEN: Skåne, Pålsiö [= Pålsjö] (UZI, Lund).
Labels. Pål. [hand]; ungularis [Thomson cabinet label].
Identity. Lathrolestes ungularis (Thomson).

Lathroplex clypearis, 1887*c*: 1135. Lectotype ♀, SWEDEN: Skåne, Ringsiön [= Ringsjön] (UZI, Lund), by designation of Horstmann, 1977: 68.

Label. Rsiö [printed].

Identity. Campoplex clypearis (Thomson). Horstmann (1977) considers *Lathroplex* distinct from *Campoplex*.

Lathrostiza forticanda, 1887*c*: 1153. Lectotype ♀, SWEDEN: Lappland (UZI, Lund), by designation of Horstmann, 1971*a*: 11.

Labels. Lpl. [printed]; Ths [printed]; forticauda [Thomson cabinet label].

Authors since Thomson (including Horstmann, 1971) have chosen to alter the spelling of the name to *forticauda* and there is evidence (Thomson's own cabinet label) that this is what was intended. However, a strict interpretation of Article 32(a)(ii) of the *Code* (as amended, *Bull. zool. Nom.* **31** (1974): 83) suggests that the original spelling should be retained.

Identity. Lathrostizus forticanda (Thomson).

Lathrostiza sternocera, 1887*c*: 1152. Lectotype ♀, SWEDEN: Skåne, Stehag (UZI, Lund), by designation of Horstmann, 1971*a*: 10.

Label. Ste 5/81 [hand].

Identity. Lathrostizus sternocerus (Thomson).

Leptocryptus brevis, 1884: 965. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Sawoniewicz, 1978: 126.

Labels. Lund [printed]; brevis [Thomson cabinet label].

Identity. Junior synonym of *Bathythrix aereus* (Gravenhorst) (Sawoniewicz, 1978: 126).

Leptocryptus clavipes, 1888*b*: 1243. Lectotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 127.

Labels. Örtofta [printed]; clavipes [Thomson cabinet label].

I do not consider that the earlier publication by Aubert (1964: 61), cited by Horstmann (1976*a*: 28), constitutes a valid lectotype designation.

Identity. Leptocryptoides clavipes (Thomson) (Horstmann, 1976*a*: 27).

Leptocryptus collaris, 1896: 2388. Lectotype ♀, SWEDEN: Skåne, Röstånga (UZI, Lund), by designation of Sawoniewicz, 1980: 356.

Labels. Röst. [hand]; collaris n [hand].

Identity. Bathythrix collaris (Thomson).

Leptocryptus geniculosus, 1884: 966. Lectotype ♀, SWEDEN: Småland (UZI, Lund), by designation of Aubert, 1966: 129.

Labels. Sm. [printed]; geniculosus [Thomson cabinet label].

Identity. Junior synonym of *Bathythrix fragilis* (Gravenhorst) (Sawoniewicz, 1978: 127).

Leptocryptus heteropus, 1884: 1040. Lectotype ♀, SWEDEN: Skåne, Bökeberg (UZI, Lund), by designation of Hinz *in* Sawoniewicz, 1980: 360.

Labels. Yddinge [printed]; heteropus [Thomson cabinet label].

Identity. Junior synonym of *Bathythrix linearis* (Gravenhorst) (Sawoniewicz, 1980: 360).

Leptocryptus lamina, 1884: 965. Lectotype ♀, SWEDEN: Skåne, Yddinge (UZI, Lund), by designation of Aubert, 1972: 148.

Label. Yd. [hand].

Identity. Bathythrix laminus (Thomson).

Leptocryptus rugulosus, 1884: 966. Lectotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Sawoniewicz, 1980: 329.

Labels. Ört. [hand]; rugulosus [Thomson cabinet label].

Identity. Bathythrix rugulosus (Thomson).

Leptocryptus strigosus, 1884: 964. Lectotype ♀, SWEDEN: Skåne, Helsingborg (UZI, Lund), by designation of Aubert, 1972: 148.

Label. Hbg. [hand].

Identity. Bathythrix strigosus (Thomson).

Limneria costalis, 1887*c*: 1106. Lectotype ♀, SWEDEN: Norrland (UZI, Lund), by designation of Aubert, 1966: 130.

Label. Norl. [printed].

Although Townes, Momoi & Townes (1965: 272) were almost certainly correct in recognising this as the type (= holotype, the single original specimen) Aubert chose to designate it as lectotype. He presented no evidence of a syntype series.

Identity. Sinophorus costalis (Thomson).

Limneria crassifemur, 1887*c*: 1106. Lectotype ♀, SWEDEN: Skåne, Ringsiön [= Ringsjön] (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 272.

Labels. [green square]; crassifemur [Thomson cabinet label].

Identity. Sinophorus crassifemur (Thomson).

Limneria fuscicarpus, 1887*c*: 1104. Lectotype ♂, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 272.

Label. Pål. [hand].

Identity. Sinophorus fuscicarpus (Thomson).

Limneria hyperborea, 1887*c*: 1106. Holotype ♀, NORWAY: Tromsø (UZI, Lund).

Labels. Tromsö 14.6.77 [hand]; hyperborea [Thomson cabinet label].

Identity. Tranosema hyperborea (Thomson) (Horstmann, 1977: 78).

Limneria nigritella, 1887*c*: 1107. Type(s) ♀, SWEDEN: Skåne, Sjöbo (lost).

Identity. ? *Sinophorus nigritellus* (Thomson) **comb. n.**

Limneria pineticola, 1887*c*: 1108. Lectotype ♀, SWEDEN: Skåne, Kävlinge (UZI, Lund), by designation of Aubert, 1968: 195.

Label. Kfge [hand].

Identity. Sinophorus pineticola (Thomson).

Limneria planiscapus, 1887*c*: 1105. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Aubert, 1966: 130.

Labels. Lund 24/5 [hand]; planiscapus [Thomson cabinet label].

Identity. Sinophorus planiscapus (Thomson).

Limneria pleuralis, 1887*c*: 1105. Syntypes 2 ♀, SWEDEN: Skåne, Fogelsång [= Fågelsång] (UZI, Lund).

Labels. Scan occi [printed] (2 ♀).

Identity. Sinophorus pleuralis (Thomson) **comb. n.**

Limneria rufifemur, 1887*c*: 1106. Lectotype ♀, SWEDEN: Skåne, Torekov (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 273.

Labels. Tkov 18/6 [hand]; rufifemur [Thomson cabinet label]; 72. [hand].

Identity. Sinophorus rufifemur (Thomson).

Limneria tegularis, 1887*c*: 1107. Holotype ♀, SWEDEN: Skåne, Skanör (UZI, Lund).

Labels. Skanör [hand]; tegularis [Thomson cabinet label].

Identity. Sinophorus tegularis (Thomson) **comb. n.**

Liocryptus tenuicornis, 1896: 2356. Holotype ♀, SWEDEN: Norrland (UZI, Lund).

Label. Norrl [printed].

Identity. Idiolispa tenuicornis (Thomson).

Lissonota antennalis, 1877: 765. LECTOTYPE ♀, SWEDEN: Skåne, Ilstorp (UZI, Lund), here designated (selected by R. Hinz).

Label. Ilsp 15/8 [hand].

Identity. Lissonota antennalis Thomson.

Lissonota basalis, 1889: 1424. Lectotype ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), by designation of Aubert, 1972: 146.

Labels. Rsiö [printed]; basalis m [Thomson cabinet label].

Identity. Junior primary homonym of *Lissonota basalis* Brischke, 1865. Replacement name *Lissonota mutanda* Schmiedeknecht, 1900: 377. Junior synonym of *Lissonota saturator* (Thunberg) (Aubert, 1978*b*: 110).

Lissonota carinifrons, 1877: 768. Syntypes 2 ♀, SWEDEN: Skåne, Äsperöd (UZI, Lund).

Labels. Esp [printed]; carinifrons [Thomson cabinet label] (1 ♀). Fall. [hand]; Col Zet [printed] (1 ♀).

Identity. Junior synonym of *Lissonota quadrinotata* Gravenhorst (Aubert, 1978*b*: 108).

Lissonota clypealis, 1877: 769. LECTOTYPE ♀, SWEDEN: Skåne, Helsingborg, Pålsjö (UZI, Lund), here designated (selected by J. F. Aubert).

Label. Pål. [hand].

Aubert's mention (1978*b*: 87) of 'lectotype inédit, Pålsjö ♀' is not a valid lectotype designation because he does not indicate to which of three species it applies.

Identity. Lissonota clypealis Thomson.

Lissonota crassipes, 1877: 772. Lectotype ♀, SWEDEN: Skåne, Lindholmen (UZI, Lund), by designation of Aubert, 1966: 127.

Label. Lhn 14/8 [hand].

Identity. Junior synonym of *Lissonota biguttata* Holmgren (Aubert, 1978*b*: 84).

Lissonota folii, 1877: 771. Lectotype ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), by designation of Townes, Momoi &Townes, 1965: 217.

Labels. Ringsjö 16/7 [hand]; uv Cyn. qu. g . . . . [hand, partly illegible]; folii [Thomson cabinet label].

Identity. Lissonota folii Thomson.

Lissonota genalis, 1877: 760. Syntypes 2 ♀, SWEDEN: Norrland (UZI, Lund).

Labels. Norl. [printed]; genalis [Thomson cabinet label] (1 ♀). Norl. [printed] (1 ♀).

Aubert (1972: 146) probably only saw one specimen, which he assumed (quite reasonably, but incorrectly) to be a holotype.

Identity. Cryptopimpla genalis (Thomson).

Lissonota gracilipes, 1877: 770. Lectotype ♀, SWEDEN: Skåne, Båstad (UZI, Lund), by designation of Aubert, 1966: 127.

Label. Båst [hand].

Identity. Lissonota gracilipes Thomson.

Lissonota hians, 1877: 762. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Aubert, 1978*b*: 91.

Label. Ld 27/5 [hand].

Identity. Junior synonym of *Lissonota digestor* (Thunberg) (Aubert, 1978*b*: 91).

Lissonota humerella, 1877: 771. Lectotype ♀, SWEDEN: Öland (UZI, Lund), by designation of Aubert, 1966: 127.

Labels. Ö. [printed]; humerella [Thomson cabinet label].

Identity. Lissonota humerella Thomson.

Lissonota impressifrons, 1889: 1419. Lectotype ♀, FRANCE (UZI, Lund), by designation of Aubert, 1972: 146.

Labels. Gall. [hand]; impressifrons m [hand].

Identity. Lissonota impressifrons Thomson.

Lissonota irrigua, 1888*b*: 1248. Lectotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 218.

Labels. Ört. [hand]; irrigua [Thomson cabinet label].

Identity. Junior synonym of *Lissonota coracina* (Gmelin) (Aubert, 1978*b*: 89).

Lissonota nigridens, 1889: 1425. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1972: 146.

Labels. Pål [hand]; nigridens [Thomson cabinet label].

Identity. Lissonota nigridens Thomson.

Lissonota palpalis, 1889: 1422. Lectotype ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), by designation of Aubert, 1968: 194.

Label. Rsiö [printed].

Identity. Lissonota palpalis Thomson.

Lissonota punctiventris, 1877: 769. Replacement name for *Lissonota errabunda* Holmgren, 1860, junior secondary homonym of *Lissonota errabunda* (Gravenhorst, 1829*b*) in Thomson's treatment (1877: 759–772) of this group.

The Thomson name is a junior objective synonym of the Holmgren name, and as such must have the same type. The lectotype designations of Townes, Momoi & Townes (1965: 219) and Aubert (1966: 127) for *punctiventris* are invalid. A lectotype for *Lissonota errabunda* Holmgren, and thus also for *Lissonota punctiventris* Thomson, 1877, was designated by Aubert (1968: 187).

Identity. Under the provisions of Article 59(b)(i) of the *Code* (as amended, *Bull. zool. Nom.* **31** (1974): 83) the International Commission must decide whether *punctiventris* or *errabunda* should be used, because the rejected homonym (*errabunda*) continued to be and is currently in use as the name of this species. However, this might be an academic point as Aubert (1978*b*: 85, 93) suggests that the species might be a junior synonym of *Lissonota buccator* (Thunberg).

Lissonota (Syzeucta) punctiventris, 1894: 2128. Holotype ♀, ITALY: Trieste (UZI, Lund).

Label. 29/VI Triest. [date, hand; locality, printed].

It is difficult to see why Aubert (1978*b*: 133) stated that this species was described as a variety of *Lissonota punctiventris* Thomson, 1877 and that the name is 'sans valeur systématique'. After describing a variety of *S. maculatoria* from Holmgren's collection Thomson (1894: 2128) immediately described the new species as follows:

> 'Anm. Från Triest har jag erhållit en hona, som synes tillhöra en annan art:
>
> 1b. S. *punctiventris* m.
>
> Praecedentis varietati similis, sed major, abdomine segmentis anterioribus parcius subtiliter punctatis'.

He in no way referred to *L. punctiventris*. Schmiedeknecht (1900: 345) gave a clear account of the situation.

Identity. Junior primary homonym of *Lissonota punctiventris* Thomson, 1877. Replacement name *Syzeuctus tenuifasciatus* Schmiedeknecht, 1900: 345.

Lissonota rimator, 1877: 762. Syntypes 1 ♀, 3 ♂, SWEDEN: Nerike [= Närke] and Skåne, Lund (UZI, Lund).

Labels. Ner. [hand] (1 ♀, 2 ♂). L-d [printed] (1 ♂).

The specimen published as lectotype by Aubert (1972: 146) is labelled 'Gbg' (= Göteborg) and cannot therefore be one of the syntypes. The four syntypes noted above were found in the duplicate collection (the fourth drawer in cabinet 404) under the name *Lissonota rimator*. They have been transferred to the main collection.

Identity. *Lissonota rimator* Thomson.

Lissonota subfumata, 1877: 760. Lectotype ♀, SWEDEN: Skåne, Ilstorp (UZI, Lund), by designation of Aubert, 1972: 146.

Labels. Ilsp 25/7 [hand]; subfumata [Thomson cabinet label].

Identity. *Cryptopimpla subfumata* (Thomson).

Lissonota tenerrima, 1877: 766. Lectotype ♀, SWEDEN: Småland (UZI, Lund), by designation of Aubert, 1972: 146.

Label. Coll. L-gh [printed].

Identity. *Lissonota tenerrima* Thomson.

Lissonota varicoxa, 1877: 768. Holotype ♀, SWEDEN: Skåne, Markiehage (UZI, Lund).

Labels. Mrki [hand]; varicoxa [hand].

Identity. Junior synonym of *Lissonota buccator* (Thunberg) (Aubert, 1978*b*: 85).

Macrochasmus alysiina, 1888*b*: 1279. LECTOTYPE [?sex], SWEDEN: Lappland (UZI, Lund), here designated (selected by H. K. Townes).

Label. Lap [hand].

The lectotype is badly damaged and lacks head and gaster. No other syntypes are present in the collection.

Identity. *Idiogramma alysiina* (Thomson).

Macrocryptus coraebi, 1885: 19. Syntypes ♀ ♂, FRANCE (lost).

Thomson attributed this species to Régimbart as '*Cryptus Coraebi* Régimb.' but said that it belonged in the genus *Macrocryptus*. The name was never published by Régimbart and therefore Thomson is the author.

The name has often been misspelled *coroebi*.

Identity. *Xylophrurus coraebi* (Thomson).

Megastylus (Helictes) pilicornis, 1888*b*: 1312. Holotype ♀, GERMANY (WEST): Aachen (ZSBS, Munich).

Labels. ♀ 30 .... Aachen [hand, partly illegible]; Pilicornis Thoms [hand]; invalidus Frst. [hand].

Identity. *Helictes pilicornis* (Thomson).

Megastylus (Megastylus) pleuralis, 1888*b*: 1313. Syntypes 1 ♀, 1 ♂, U.S.S.R.: Tartu [not 'norra Tyskland' as stated by Thomson] (UZI, Lund).

Labels. 26/8 85. [hand]; Dorpat [hand]; pleuralis [Thomson cabinet label] (♀). 26/8 85. [hand]; 926 [hand] (♂).

The specimens match the description and are almost certainly the syntypes. The locality given by Thomson is obviously a mistake (which he also made in the case of *Campoplex latungula*).
Identity. Megastylus pleuralis Thomson.

Meloboris hygrobia, 1887*c*: 1151. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Horstmann, 1969: 432.
Labels. Ld [printed]; hygrobia [Thomson cabinet label].
Identity. Diadegma hygrobia (Thomson).

Meloboris ischnocera, 1887*c*: 1151. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Horstmann, 1969: 432.
Label. Ld [hand].
Identity. Junior synonym of *Diadegma hygrobia* (Thomson) (Horstmann, 1969: 432).

Mesochorus (Mesochorus) acuminatus, 1886*a*: 343. LECTOTYPE ♂, SWEDEN: Skåne, Yddinge (UZI, Lund), here designated (selected by W. Schwenke).
Labels. Yd. [hand]; acuminatus [Thomson cabinet label].
Identity. Mesochorus acuminatus Thomson.

Mesochorus (Mesochorus) albipes, 1886*a*: 341. LECTOTYPE ♀, SWEDEN: Skåne, Lund (UZI, Lund), here designated (selected by R. Hinz).
Labels. Ld [hand]; albipes [Thomson cabinet label].
Identity. Mesochorus albipes Thomson.

Mesochorus (Mesochorus) angustatus, 1886*a*: 343. LECTOTYPE ♀, SWEDEN: Skåne, Lund (UZI, Lund), here designated (selected by W. Schwenke).
Labels. Ld [hand]; angustatus [Thomson cabinet label].
Identity. Mesochorus angustatus Thomson.

Mesochorus (Stictopisthus) bilineatus, 1886*a*: 344. LECTOTYPE ♂, SWEDEN: Skåne, Lund (UZI, Lund), here designated (selected by W. Schwenke).
Labels. Lund [printed]; bilineatus [Thomson cabinet label].
Identity. Stictopisthus bilineatus (Thomson).

Mesochorus (Mesochorus) brevicollis, 1886*a*: 335. LECTOTYPE ♀, SWEDEN: Skåne, Helsingborg (UZI, Lund), here designated (selected by W. Schwenke).
Label. Hbg [hand].
Identity. Mesochorus brevicollis Thomson.

Mesochorus (Mesochorus) brevigena, 1886*a*: 338. LECTOTYPE ♀, SWEDEN: Skåne, Helsingborg (UZI, Lund), here designated (selected by K. Horstmann).
Labels. Hg [hand]; brevigena [Thomson cabinet label].
Identity. Mesochorus brevigena Thomson.

Mesochorus (Astiphrommus) buccatus, 1886*a*: 329. LECTOTYPE ♀, SWEDEN: Skåne, Tvedöra (UZI, Lund), here designated (selected by W. Schwenke).
Labels. Tve 6/78 [hand]; [small gold square]; buccatus [Thomson cabinet label].
Identity. Astiphromma buccatum (Thomson).

Mesochorus (Stictopisthus) convexicollis, 1886*a*: 344. LECTOTYPE ♀, SWEDEN: Skåne, Helsingborg (UZI, Lund), here designated (selected by W. Schwenke).
Labels. Hbg. [hand]; convexicollis [Thomson cabinet label].
Identity. Stictopisthus convexicollis (Thomson).

Mesochorus (Mesochorus) crassicrus, 1886*a*: 339. Syntypes 3 ♀, 3 ♂, 1 ?sex, SWEDEN: Skåne (UZI, Lund).
Labels. Pål. [hand]; crassicrus [Thomson cabinet label] (1 ♀). Ört. [hand] (2 ♂). Pål. [hand] (1 ♀, 1 ♂). Rsiö [printed] (1 ♀). Sbg 23/7 [hand] (1 ?sex).
Identity. Mesochorus crassicrus Thomson.

Mesochorus (Mesochorus) curvicauda, 1886*a*: 335. LECTOTYPE ♀, SWEDEN: Öland (UZI, Lund), here designated (selected by W. Schwenke).
Labels. Ö. [printed]; curvicauda [Thomson cabinet label].
Identity. Mesochorus curvicauda Thomson.

Mesochorus (Mesochorus) curvulus, 1886*a*: 343. LECTOTYPE ♂, SWEDEN: Skåne, Örtofta (UZI, Lund), here designated (selected by W. Schwenke).
Label. Ört. [hand].
Identity. Mesochorus curvulus Thomson.

Mesochorus (Mesochorus) fulvus, 1886*a*: 336. Lectotype ♀, Sweden: Skåne, Pålsjö (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 342.
Labels. Pål [hand]; fulvus [Thomson cabinet label].
Identity. Mesochorus fulvus Thomson.

Mesochorus (Astiphrommus) graniger, 1886*a*: 328. LECTOTYPE ♀, Sweden: Skåne, Örtofta (UZI, Lund), here designated (selected by R. Hinz).
Labels. Ört. [hand]; graniger [Thomson cabinet label].
Identity. Astiphromma graniger (Thomson).

Mesochorus (Astiphrommus) hamulus, 1886*a*: 330. ? Syntype 1 ♂, Denmark: Zealand, Strandmøllen (ZM, Copenhagen).
Labels. ♂ Strandm Drewsen [hand]; Danmark ex coll. Schiødte [printed]; Hamulus Thoms: [hand].
There are no syntypes in the Thomson collection in Lund. There is, unfortunately, no direct evidence that the specimen in Copenhagen is a syntype.
Identity. Astiphromma hamulum (Thomson).

Mesochorus (Astiphrommus) incidens, 1886*a*: 331. Type(s) ♀, England (lost).
There are no specimens of this species in the Bridgman collection (A. G. Irwin, pers. comm.) (see Bridgman, 1886: 335, 353 and 354). The only specimen in the Thomson collection is from Pålsjö and cannot be a type.
Identity. Astiphromma incidens (Thomson).

Mesochorus (Mesochorus) lapponicus, 1886*a*: 336. LECTOTYPE ♀, Sweden: Lappland (UZI, Lund), here designated (selected by W. Schwenke).
Labels. Lap [hand]; Lapponicus [Thomson cabinet label].
Identity. Mesochorus lapponicus Thomson.

Mesochorus (Stictopisthus) laticeps, 1886*a*: 344. LECTOTYPE ♀, Sweden: Skåne, Bökeberg (UZI, Lund), here designated (selected by W. Schwenke).
Labels. Bök 8/84 [hand]; laticeps [Thomson cabinet label].
Identity. Stictopisthus laticeps (Thomson).

Mesochorus (Mesochorus) longicauda, 1886*a*: 338. Lectotype ♀, Sweden: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1972: 152.
Label. Pål [hand].
Identity. Mesochorus longicauda Thomson.

Mesochorus (Mesochorus) macrurus, 1886*a*: 342. LECTOTYPE ♀, Sweden: Lappland (UZI, Lund), here designated (selected by W. Schwenke).
Labels. [small paper square]; [small paper square]; Lpl. [hand]; macrurus [Thomson cabinet label].
Identity. Mesochorus macrurus Thomson.

Mesochorus (Astiphrommus) mandibularis, 1886*a*: 330. Lectotype ♀, Sweden: Skåne, Yddinge (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 340.
Labels. Yd [hand]; mandibularis [Thomson cabinet label].
Townes, Momoi &Townes (1965: 340) gave the original combination incorrectly as *Astiphrommus mandibularis.*
Identity. Astiphromma mandibulare (Thomson).

Mesochorus (Mesochorus) marginatus, 1886*a*: 339. Lectotype ♀, Sweden: Skåne (UZI, Lund), by designation of Aubert, 1966: 131.
Label. Scan [printed].
Identity. Mesochorus marginatus Thomson.

Mesochorus (Mesochorus) nigriceps, 1886*a*: 334. LECTOTYPE ♀, Sweden: Skåne, Lund (UZI, Lund), here designated (selected by W. Schwenke).
Label. L-d [printed].
Identity. Mesochorus nigriceps Thomson.

Mesochorus (Mesochorus) pectinipes, 1886*a*: 336. Lectotype ♀, Sweden: Skåne (UZI, Lund), by designation of Townes, Momoi &Townes, 1965: 344.
Label. Scan [printed].
Identity. Junior primary homonym of *Mesochorus pectinipes* Bridgman, 1883. Replacement name *Mesochorus suecicus* Dalla Torre, 1901: 58

Mesochorus (Mesochorus) picticrus, 1886*a*: 340. LECTOTYPE ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), here designated (selected by R. Hinz).

Label. Pål [hand].

Identity. Mesochorus picticrus Thomson.

Mesochorus (Astiphrommus) plagiatus, 1886*a*: 332. Syntypes 1 ♂, SWEDEN: Skåne, Helsingborg (UZI, Lund); 1 ♂, ENGLAND (CM, Norwich).

Labels. Hbg. [hand]; plagiatus [Thomson cabinet label] (Lund specimen). 546 [hand, on the specimen mount]; G. C. Bignell April 1882 from Apanteles from Odontopera bidentata [hand, on the underside of the specimen mount]; plagiatus Thom [hand]; 3 [hand] (Norwich specimen).

The Norwich specimen is in the J. B. Bridgman collection. From Bridgman's paper (1886: 335, 353 and 354) and the label with the number (3) it is virtually certain that this specimen was sent to Thomson and is a syntype.

Identity. Astiphromma plagiatum (Thomson).

Mesochorus (Mesochorus) punctipleuris, 1886*a*: 334. Lectotype ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), by designation of Aubert, 1966: 131.

Label. Rsiö [printed].

Identity. Mesochorus punctipleuris Thomson.

Mesochorus (Mesochorus) salicis, 1886*a*: 338. LECTOTYPE ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), here designated (selected by W. Schwenke).

Labels. Rsiö [printed]; Salicis [Thomson cabinet label].

Identity. Mesochorus salicis Thomson.

Mesochorus (Astiphrommus) simplex, 1886*a*: 334. LECTOTYPE ♀, SWEDEN: Skåne, Yddinge (UZI, Lund), here designated (selected by W. Schwenke).

Labels. Yd [hand]; simplex [Thomson cabinet label].

Identity. Astiphromma simplex (Thomson).

Mesochorus (Mesochorus) stigmaticus, 1886*a*: 341. LECTOTYPE ♀, DENMARK: Maribo (UZI, Lund), here designated (selected by W. Schwenke).

Labels. 28/7 77 Maribo ex Microgaster [hand]; stigmaticus [Thomson cabinet label].

Identity. Junior primary homonym of *Mesochorus stigmaticus* Brischke, 1880. Replacement name *Mesochorus orgyiae* Dalla Torre, 1901: 56.

Mesochorus (Mesochorus) temporalis, 1886*a*: 336. Syntype 1 ♀, ENGLAND (CM, Norwich).

Labels. Bred from filipendulae 25.7.78 G. C. Bignell [hand, on the underside of the specimen mount]; 48 [hand]; temporalis Thn [hand].

The syntype is in the Bridgman collection. For the reasons why it is considered as such see the notes under *M. plagiatus* above.

Identity. Mesochorus temporalis Thomson.

Mesochorus (Astiphrommus) tenuicornis, 1886*a*: 332. LECTOTYPE ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), here designated (selected by R. Hinz).

Labels. Pål [hand]; tenuicornis [Thomson cabinet label].

Identity. Astiphromma tenuicornis (Thomson).

Mesochorus (Mesochorus) tenuiscapus, 1886*a*: 341. LECTOTYPE ♀, SWEDEN: Lappland, Lund (UZI, Lund), here designated (selected by W. Schwenke).

Labels. Lund 3 Ag. [hand]; Lpl. [printed]; tenuiscapus [Thomson cabinet label].

Identity. Mesochorus tenuiscapus Thomson.

Mesochorus (Mesochorus) tuberculiger, 1886*a*: 333. Lectotype ♂, SWEDEN: Skåne, Torekov (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 345.

Labels. Trkv [hand]; tuberculiger [Thomson cabinet label].

Identity. Mesochorus tuberculiger Thomson.

Mesocryptus nigriventris, 1896: 2384. Holotype ♀, SWEDEN: 'Halland' [Skåne], Margretetorp (UZI, Lund).

Labels. Hall. [printed]; nigriventris m [Thomson cabinet label].

Margretetorp is in northern Skåne, not southern Halland as stated by Thomson. It is near the boundary between the two provinces, so Thomson's error is easily explained.

Identity. Oresbius nigriventris (Thomson) **comb. n.**

Mesocryptus ochrostomus, 1896: 2384. Holotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund).
Labels. Pål [hand]; ochrostomus m [Thomson cabinet label].
Identity. Aptesis ochrostomus (Thomson) **comb. n.**

Mesoleius (Alexeter) albilabris, 1894: 2025. Syntypes 3 ♀, 3 ♂, SWEDEN: Skåne, Pålsjö (UZI, Lund).
Labels. Pål. [hand]; ♀ [printed] (3 ♀). Pålsiö [printed] (1 ♂). Hbg [hand]; scutellaris [Thomson cabinet label] (1 ♂). Hbg. [hand] (1 ♂).
Identity. Alexeter albilabris (Thomson).

Mesoleius (Barytarbus) annulipes, 1883: 932. Holotype ♂, SWEDEN: Gotland (UZI, Lund).
Labels. Got [printed]; annulipes [Thomson cabinet label].
Identity. Barytarbes annulipes (Thomson).

Mesoleius (Mesoleius) brachypus, 1894: 2054. Lectotype ♀, SWEDEN: Norrland (UZI, Lund), by designation of Aubert, 1976*b*: 269.
Labels. Col. Rud. [hand]; brachypus m [Thomson cabinet label].
Identity. Anoncus brachypus (Thomson).

Mesoleius (Mesoleius) brevipalpis, 1894: 2047. Lectotype ♀, SWEDEN: Öland (UZI, Lund), by designation of Aubert, 1976*b*: 269.
Labels. Ö. [printed]; ♀ [printed]; brevipalpis [Thomson cabinet label].
Identity. Mesoleius brevipalpis Thomson.

Mesoleius (Saotus) brevispina, 1883: 934. Syntypes 8 ♀, SWEDEN: Skåne, Lund (UZI, Lund).
Labels. Lund [printed]; brevispina [Thomson cabinet label] (4 ♀, all on one pin). Lund [printed] (4 ♀, two on one pin).
Identity. Saotis brevispina (Thomson).

Mesoleius (Mesoleius) brevitarsis, 1894: 2037. Lectotype ♀, SWEDEN: Norrland (UZI, Lund), by designation of Aubert, 1976*b*: 269.
Labels. Norl. [printed]; brevitarsis m [Thomson cabinet label].
Identity. Anoncus brevitarsis (Thomson).

Mesoleius (Lamachus) castaneiventris, 1894: 2023. ? Syntypes 2 ♀, SWEDEN: Vestergötland [= Västergötland] (UZI, Lund).
Labels. Col. Hgn. [printed]; castaneiventris [Thomson cabinet label] (1 ♀). Col. Hgn. [printed] (1 ♀).
The two females originating from Holmgren's collection are the only specimens under this name. They have no indication of locality but they may well be syntypes.
Identity. Lamachus castaneiventris (Thomson).

Mesoleius (Mesoleius) clypealis, 1894: 2077. Lectotype ♀, SWEDEN: 'Halland' [Skåne], Margretetorp (UZI, Lund), by designation of Aubert, 1966: 127.
Label. Hall. [printed].
Margretetorp is in northern Skåne, not southern Halland as stated by Thomson. It is near the boundary between the two provinces, so Thomson's error is easily explained.
Identity. Campodorus clypealis (Thomson).

Mesoleius (Saotus) compressiusculus, 1883: 934. Syntypes 1 ♀, 3 ♂, SWEDEN: Skåne, Ringsiön [= Ringsjön] (UZI, Lund).
Labels. [small green square]; 146. [hand]; compressiusculus [Thomson cabinet label] (1 ♀). [small green square] (3 ♂).
Identity. Saotis compressiusculus (Thomson).

Mesoleius (Spudaeus) confusus, 1883: 932. Syntypes 4 ♀, 3 ♂, SWEDEN: Skåne, Ringsjön and Lindholmen (UZI, Lund).
Labels. [small green square]; ♀ [printed]; confusus [Thomson cabinet label] (1 ♀). [small green square]; ♀ [printed] (2 ♀). Lhn 29/5 [hand]; 82. [hand] (1 ♂). Lhn 12/6 [hand]; 81. [hand] (1 ♂). Scan [printed] (1 ♂). [small green square] (1 ♂).
Identity. Rhinotorus confusus (Thomson) **comb. n.**

Mesoleius (Mesoleius) crassipes, 1894: 2060. Lectotype ♀, SWEDEN: Norrland (UZI, Lund), by designation of Aubert, 1976*b*: 270.
Labels. Col. Rud. [hand]; crassipes [Thomson cabinet label].
Identity. Campodorus crassipes (Thomson).

Mesoleius (Mesoleius) crassitarsis, 1883: 935. Type(s) ♀, SWEDEN: Skåne, Ryssjöholm [= Rössjöholm] (lost).

The male from Pålsjö (Thomson, 1888*b*: 1262) published as lectotype by Aubert (1976*b*: 270) cannot be a syntype. The lectotype designation is therefore invalid. The female mentioned by Aubert is from Skånes–Fagerhult and, also, cannot be a syntype.

Identity. *Campodorus crassitarsis* (Thomson) (Aubert, 1976*b*: 270, on the basis of the invalid 'lectotype').

Mesoleius (Mesoleius) curtitarsis, 1894: 2038. Lectotype ♀, SWEDEN: Östergötland (UZI, Lund), by designation of Aubert, 1976*b*: 270.

Labels. 86. [hand]; OG. [hand]; curtitarsis [Thomson cabinet label].

Identity. *Campodorus curtitarsis* (Thomson).

Mesoleius (Mesoleius) deletus, 1894: 2069. Lectotype ♀, SWEDEN: 'Halland' [Skåne], Margretetorp (UZI, Lund), by designation of Aubert, 1976*b*: 270.

Label. Hall [printed].

Margretetorp is in northern Skåne, not Halland as stated by Thomson. It is near the boundary between the two provinces, so Thomson's error is easily explained.

Identity. *Campodorus deletus* (Thomson).

Mesoleius (Scopesus) depressus, 1894: 2030. Holotype ♀, SWEDEN (UZI, Lund).

Labels. Col Ljgh [printed]; depressus [Thomson cabinet label].

Identity. *Scopesis depressus* (Thomson).

Mesoleius (Lagarotus) didymus, 1894: 2024. Type(s) ♀, GERMANY (WEST): Bavaria (lost).

There are no specimens under this name in the Thomson collection and Diller (pers. comm.) has been unable to trace it in the Kriechbaumer collection in Munich.

Identity. ? *Lagarotis didymus* (Thomson).

Mesoleius (Saotus) dorsatus, 1888*b*: 1264. Holotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund).

Labels. Pål [hand]; dorsatus [Thomson cabinet label].

Identity. *Saotis dorsatus* (Thomson).

Mesoleius (Saotus) emarginatus, 1883: 933. Syntypes 2 ♀, 1 ♂, SWEDEN: Skåne, Örtofta (UZI, Lund).

Labels. pil [hand]; Ört. [hand]; emarginatus [Thomson cabinet label] (1 ♀). Ört. [hand] (1 ♀). Ört. [hand]; ♂ [printed] (1 ♂).

Identity. *Saotis emarginatus* (Thomson).

Mesoleius (Mesoleius) femorator, 1894: 2047. Lectotype ♀, SWEDEN: Norrland (UZI, Lund), by designation of Aubert, 1976*b*: 271.

Label. Col. Rui [hand].

Identity. *Anoncus femorator* (Thomson).

Mesoleius (Barytarbus) flavicornis, 1892*b*: 1875. Holotype ♀, FRANCE (UZI, Lund).

Labels. Fr. merid.1 [hand]; Gall [hand]; flavicornis [Thomson cabinet label].

Identity. *Mesoleptidea flavicornis* (Thomson) **comb. n.**

Mesoleius (Perispudus) flavitarsis, 1894: 2023. Holotype ♂, FRANCE: Libercourt (UZI, Lund).

Labels. Libercourt. [hand]; Gallia [printed]; flavitarsis [Thomson cabinet label].

Identity. *Perispuda flavitarsis* (Thomson).

Mesoleius (Barytarbus) flavoscutellatus, 1892*b*: 1876. Holotype ♂, FRANCE: Lapugnoy (UZI, Lund).

Labels. Lapugnoy. [hand]; Gall [hand]; flavoscutellat [Thomson cabinet label].

Identity. *Barytarbes flavoscutellatus* (Thomson).

Mesoleius (Mesoleius) frenalis, 1894: 2047. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1976*b*: 271.

Label. Pål [hand].

Identity. *Mesoleius frenalis* Thomson.

Mesoleius (Mesoleius) frontatus, 1894: 2069. Syntype 1 ♂, SWEDEN: Skåne, Ystad (UZI, Lund).

Label. Ys [hand].

The female specimen published as lectotype by Aubert (1976*b*: 271) is from Östergötland and cannot be a syntype. It is labelled 'OG', which Aubert misread (upside down) as '50'. The lectotype designation is therefore invalid.

Identity. *Mesoleius frontatus* Thomson.

Mesoleius (Mesoleius) gallicus, 1894: 2041. Lectotype ♀, FRANCE: Phalempin (UZI, Lund), by designation of Aubert, 1976*b*: 272.
Labels. Phalempin. [hand]; Gall [hand]; Gallicus m [Thomson cabinet label].
Identity. Campodorus gallicus (Thomson).

Mesoleius (Mesoleius) glyptus, 1894: 2076. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1976*b*: 272.
Label. Pål [hand].
Identity. Campodorus glyptus (Thomson).

Mesoleius (Protarchus) grandis, 1888*b*: 1260. Lectotype ♀, SWEDEN: Skåne (UZI, Lund), by designation of Aubert, 1966: 127.
Labels. Sk. [hand]; grandis [Thomson cabinet label].
Identity. Protarchus grandis (Thomson).

Mesoleius (Saotus) heteropus, 1883: 934. LECTOTYPE ♀, SWEDEN: Lappland (UZI, Lund), here designated (selected by R. Hinz).
Labels. Lpl. [printed]; heteropus [Thomson cabinet label].
Identity. Saotis heteropus (Thomson).

Mesoleius (Mesoleius) humerellus, 1894: 2042. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Aubert, 1976*b*: 272.
Label. L-d [printed].
Identity. Campodorus humerellus (Thomson).

Mesoleius (Otlophorus) hypomelas, 1894: 2027. LECTOTYPE ♀, GERMANY (UZI, Lund), here designated (selected by R. Hinz).
Label. 6. 296 [hand].
Identity. Otlophorus hypomelas (Thomson).

Mesoleius (Mesoleius) immarginatus, 1894: 2037. Lectotype ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), by designation of Aubert, 1976*b*: 272.
Labels. Rsiö [printed]; im̄arginatus [hand].
Identity. ? *Mesoleius immarginatus* Thomson.

Mesoleius (Mesoleius) incidens, 1894: 2077. Lectotype ♀ [not ♂ as stated by Aubert, 1976*b*: 272], SWEDEN: Skåne, Mölle (UZI, Lund), by designation of Aubert, 1976*b*: 272.
Label. Möl [hand].
Identity. Campodorus incidens (Thomson).

Mesoleius (Mesoleius) incisus, 1894: 2064. Holotype ♀, SWEDEN: Norrland (UZI, Lund).
Labels. Col. Rud. [hand]; incisus m [Thomson cabinet label].
Identity. Mesoleius incisus Thomson.

Mesoleius (Mesoleius) laevipectus, 1894: 2041. Lectotype ♂, SWEDEN: Skåne, Mölle (UZI, Lund), by designation of Aubert, 1976*b*: 273.
Label. Möl [hand].
Identity. Campodorus laevipectus (Thomson).

Mesoleius (Barytarbus) laeviusculus, 1883: 931. LECTOTYPE ♂, SWEDEN: Öland (UZI, Lund), here designated (selected by H. K. Townes).
Labels. Ö. [printed]; laeviusculus [Thomson cabinet label].

This is the specimen regarded as holotype by Aubert (1972: 147). However, it cannot be a holotype because Thomson gave a range of length and must, therefore, have had a syntype series. The specimen was labelled as lectotype by Townes, and not holotype as implied by Aubert. Aubert also interpreted the locality label 'Ö.' as meaning Örtofta (which, if correct, would have excluded the specimen from type status!).

Identity. Barytarbes laeviusculus (Thomson).

Mesoleius (Mesoleius) latiscapus, 1894: 2060. Lectotype ♀, SWEDEN: Vestergöthland [= Västergötland] (UZI, Lund), by designation of Aubert, 1976*b*: 273.
Labels. V.G. [printed]; latiscapus [Thomson cabinet label].
Identity. Campodorus latiscapus (Thomson).

Mesoleius (Saotus) liopleuris, 1888*b*: 1263. LECTOTYPE ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), here designated (selected by R. Hinz).

Labels. Pål. [hand]; liosternus [Thomson cabinet label].

Saotus liosternus (Thomson, 1894: 2018) is an incorrect subsequent spelling of *liopleuris*, and has no status in nomenclature.

Identity. Saotis liopleuris (Thomson).

Mesoleius (Mesoleius) liosternus, 1894: 2078. Syntypes ♀ ♂, SWEDEN: Jemtland [= Jämtland], Åreskutan (lost).

Aubert's publication of a neotype female (1976*b*: 273) for this species is not valid because it does not comply with the provisions of Article 75(c) of the *Code*. No attempt is made to validate that 'neotype' here because there has been no recent revisionary work on this group.

Identity. Campodorus liosternus (Thomson) (Aubert, 1976*b*: 273, on the basis of the invalid 'neotype').

Mesoleius (Mesoleius) lobatus, 1894: 2072. Lectotype ♀, SWEDEN: Skåne, Ryssjöholm [= Rössjöholm] (UZI, Lund), by designation of Aubert, 1976*b*: 273.

Labels. Rshm 16/6 [hand]; lobatus m [Thomson cabinet label].

Identity. Campodorus lobatus (Thomson).

Mesoleius (Scopesus) longigena, 1894: 2031. Syntypes 3 ♀, 3 ♂, NORWAY: Dovre and FRANCE: Libercourt and Ostricourt (UZI, Lund).

Labels. Libercourt [hand]; longigena [Thomson cabinet label] (1 ♂). Ostricourt [hand] (2 ♀). Libercourt [hand] (2 ♂). [small paper square]; Dovre. [printed] (1 ♀).

Identity. Neostroblia longigena (Thomson) **comb. n.**

Mesoleius (Saotus) longiventris, 1888*b*: 1263. Holotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund).

Labels. Ört 28/V [hand]; longiventris [Thomson cabinet label].

Identity. Saotis longiventris (Thomson).

Mesoleius (Lamachus) longiventris, 1894: 2023. Holotype ♀, SWEDEN (UZI, Lund).

Labels. Col. Hgn. [printed]; longiventris [Thomson cabinet label].

Identity. Junior primary homonym of *Mesoleius longiventris* Thomson, 1888*b*. Replacement name here proposed *Lamachus thomsoni* **nom. n.**

Mesoleius (Scopesus) macropus, 1894: 2030. Syntypes 2 ♂, SWEDEN: Skåne, Ringsjön (UZI, Lund).

Labels. [small green square] (2 ♂).

Aubert's publication of a neotype (1966: 127) for this species is, fortunately, not valid because it does not comply with the provisions of Article 75(c) of the *Code*. The discovery of syntypes does not, therefore, need a reference to the Commission (Article 75(f)).

Identity. Scopesis macropus (Thomson).

Mesoleius (Otlophorus) melanocarus, 1894: 2027. Holotype ♀, GERMANY (UZI, Lund).

Labels. 5 992 [hand]; nigrifrons [Thomson cabinet label].

Identity. Otlophorus melanocarus (Thomson).

Mesoleius (Protarchus) melanurus, 1894: 2020. Type(s) [? sex], GERMANY (WEST): Harz (lost).

Identity. Protarchus melanurus (Thomson).

Mesoleius (Perispudus) mesoxanthus, 1894: 2022. Holotype ♀, FRANCE: Vosges (UZI, Lund).

Labels. [small paper square]; Vosges. [hand]; Gall. [hand]; mesoxanthus [Thomson cabinet label].

Identity. I have not been able to satisfactorily place this species in any of the genera (as defined by Townes, 1970*b*) of the Mesoleiini.

Mesoleius (Mesoleius) nemati, 1894: 2067. Lectotype ♀, DENMARK: Sønderborg (UZI, Lund), by designation of Aubert, 1976*b*: 274.

Labels. Sdbg 25.5.81 [hand]; ..... Nematus [hand, first word illegible]; 774 [printed].

Identity. Campodorus nemati (Thomson).

Mesoleius (Saotus) nigriscuta, 1888*b*: 1264. Holotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund).

Labels. Pål. [hand]; nigriscuta [Thomson cabinet label].

Identity. Saotis nigriscuta (Thomson).

Mesoleius (Mesoleius) obliquus, 1894: 2070. Syntype 1 ♂, SWEDEN: 'Halland' [Skåne], Magretetorp (UZI, Lund).

Labels. Halland [printed]; obliquus [Thomson cabinet label].

See note on locality under *Mesoleius deletus*.

Aubert (1976*b*: 274) recognised this specimen as a holotype, but Thomson specified '♂ ♀'; showing that he had a syntype series.

Identity. Mesoleius obliquus Thomson.

Mesoleius (Mesoleius) orbitalis, 1894: 2050. Lectotype ♀, NORWAY: Forsa (UZI, Lund), by designation of Aubert, 1976*b*: 275.

Labels. Forssa 24 Juli [hand]; Lpl. [printed] [not 'Lap' as stated by Aubert]; orbitalis [Thomson cabinet label].

Identity. Junior synonym of *Hyperbatus segmentator* (Holmgren) (Aubert, 1976*b*: 275).

Mesoleius (Mesoleius) picticoxa, 1894: 2072. Lectotype ♀, GERMANY (WEST): Bavaria (UZI, Lund), by designation of Aubert, 1976*b*: 275.

Labels. Germ. [hand]; = 67 [hand].

The specimen designated as lectotype does not agree precisely with the original description in the colour of the coxae. There is therefore the possibility that it is not an original specimen. There are no other specimens in the collection which could be types and Diller (pers. comm.) has been unable to trace the species in the Kriechbaumer collection in Munich.

Identity. Mesoleius picticoxa Thomson.

Mesoleius (Mesoleius) pineti, 1894: 2071. Lectotype ♀, SWEDEN: Skåne, Fågelsång (UZI, Lund), by designation of Aubert, 1976*b*: 275.

Labels. Fsg 12/7 [hand]; ♀ [printed].

The lectotype was selected and labelled by K. Horstmann, not Townes as indicated by Aubert.

Identity. Campodorus pineti (Thomson).

Mesoleius (Mesoleius) pleuralis, 1894: 2076. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1976*b*: 275.

Labels. Pål. [hand]; ♀ [printed]; pleuralis [Thomson cabinet label].

Identity. Campodorus pleuralis (Thomson).

Mesoleius (Lathiponus) pulcherrimus, 1888*b*: 1261. LECTOTYPE ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund) here designated (selected by H. K. Townes).

Labels. Pål [hand]; pulcherrimus [Thomson cabinet label].

Identity. Junior synonym of *Lathiponus frigidus* (Woldstedt) (Townes, 1970*b*: 86).

Mesoleius (Mesoleius) rubidus, 1883: 935. Lectotype ♀, NORWAY: Dovre (UZI, Lund), by designation of Aubert, 1976*b*: 276.

Labels. none.

Identity. Mesoleius rubidus Thomson.

Mesoleius (Mesoleius) sinuatus, 1894: 2040. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1976*b*: 276.

Labels. Pål [hand]; sinuatus [Thomson cabinet label].

Identity. Mesoleius sinuatus Thomson.

Mesoleius (Mesoleius) stenostigma, 1894: 2042. Holotype ♀, SWEDEN: Norrland (UZI, Lund).

Labels. Col. Rui [hand]; stenostigma [Thomson cabinet label].

Identity. Mesoleius stenostigma Thomson.

Mesoleius (Mesoleius) subroseus, 1888*b*: 1262. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1976*b*: 277.

Label. Pål. [hand].

Identity. Mesoleius subroseus Thomson.

Mesoleius (Scopesus) tegularis, 1894: 2031. Lectotype ♀, SWEDEN: Stockholm (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 259.

Labels. Hlm [printed]; DeV [printed].

Identity. Scopesis tegularis (Thomson).

Mesoleius (Mesoleius) tenuitarsis, 1894: 2039. Holotype ♀, SWEDEN: Lappland (UZI, Lund).

Labels. [square of paper]; [square of paper]; Lap [hand]; tenuitarsis m [Thomson cabinet label].

Identity. Campodorus tenuitarsis (Thomson).

Mesoleius (Saotus) tricolor, 1883: 933. Syntypes 3 ♀, SWEDEN: Skåne, Lund (UZI, Lund).

Labels. L-d [printed]; tricolor [Thomson cabinet label] (1 ♀). Ld [hand] (1 ♀). L-d [printed] (1 ♀).

Identity. Saotis tricolor (Thomson).

Mesoleius (Mesoleius) varicoxa, 1894: 2044. Lectotype ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), by designation of Aubert, 1976*b*: 278.
Label. Rsiö [printed].
Identity. *Mesoleius varicoxa* Thomson.

Mesoleptus (Mesoleptus) holmgreni, 1894: 1982. Syntypes 3 ♀, 7 ♂, SWEDEN: Skåne, Pålsjö (UZI, Lund).
Labels. Pål [hand]; Holmgreni [Thomson cabinet label] (1 ♀). Pål. [hand] (2 ♀ 7 ♂, on 7 pins).
Identity. *Mesoleptidea holmgreni* (Thomson) **comb. n.**

Mesoleptus (Hadrodactylus) nigricoxa, 1894: 1979. Lectotype ♀, DENMARK: Satrupholz (UZI, Lund), by designation of Idar, 1973: 24.
Label. Satruph. 15.VI.93 [hand].
Idar gave the original combination incorrectly as *Hadrodactylus nigricoxa*.
Identity. Junior synonym of *Hadrodactylus femoralis* (Holmgren) (Idar, 1975: 184).

Mesoleptus (Hadrodactylus) varicoxa, 1894: 1979. Lectotype ♂, SWEDEN: Skåne, Ryssjöholm [= Rössjöholm] (UZI, Lund), by designation of Idar, 1973: 24.
Label. Rshm 16/6 [hand].
Idar gave the original combination incorrectly as *Hadrodactylus varicoxa*.
Identity. Junior synonym of *Hadrodactylus insignis* (Kriechbaumer) (Idar, 1975: 187).

Mesostenus crassifemur, 1888*b*: 1237. Lectotype ♀, SWEDEN: Skåne, Kjeflinge [= Kävlinge] (UZI, Lund), by designation of Aubert, 1966: 128.
Labels. Scan [printed]; crassifemur m [Thomson cabinet label].
Identity. *Mesostenus crassifemur* Thomson.

Mesostenus (Stenaraeus) dentifer, 1896: 2381. Syntypes 3 ♀, 1 ♂, SWEDEN: Skåne, Degeberga (UZI, Lund).
Labels. Dg [hand]; dentifer Thoms [Thomson cabinet label] (1 ♀). Dg [hand] (2 ♀ 1 ♂).
Identity. *Mesostenus dentifer* Thomson.

Mesostenus (Mesostenus) subcircularis, 1896: 2379. Holotype ♀, SWEDEN: Vermland [= Värmland] (UZI, Lund).
Labels. Wml [printed]; subcircularis Ths [hand].
Identity. Junior synonym of *Mesostenidea obnoxius* (Gravenhorst) (Horstmann, 1968: 121).

Mesostenus subovalis, 1873: 516. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Horstmann, 1968: 121.
Labels. Pål [hand]; subovalis [Thomson cabinet label].
Identity. Junior synonym of *Mesostenidea obnoxius* (Gravenhorst) (Horstmann, 1968: 121).

Metopius (Metopius) brevispina, 1887*b*: 195. Syntypes 3 ♀, SWEDEN: Skåne, Ringsjön and Rönnemölla (UZI, Lund).
Labels. Rön [hand]; brevispina [Thomson cabinet label] (1 ♀). Ringsiö [printed] (2 ♀).
Identity. *Metopius brevispina* Thomson.

Metopius (Metopius) clypealis, 1887*b*: 196. Holotype ♂, GERMANY (UZI, Lund).
Labels. Germ Ichn. [hand]; clypealis [Thomson cabinet label].
Identity. *Metopius clypealis* Thomson.

***Metopius (Peltocarus)* croceicornis**, 1887*b*: 196. Syntype 1 ♂, ? syntype 1 ♀, GERMANY and ? SWEDEN: Gotland (UZI, Lund).
Labels. [square of paper]; Germ Ichn. [hand] (♂). [square of red paper]; [square of greyish paper]; 324. [hand]; croceicornis [Thomson cabinet label] (♀).
Identity. *Metopius croceicornis* Thomson.

Metopius (Peltocarus) interruptus, 1887*b*: 197. Syntype 1 ♂, SWEDEN: Småland Markaryd (UZI, Lund).
Labels. Mark 13/6 [hand]; interruptus [Thomson cabinet label].
Identity. *Metopius interruptus* Thomson.

Microcryptus alutaceus, 1883: 863. Syntypes 2 ♂, SWEDEN: Norrland (UZI, Lund).
Labels. Norl. [printed] (2 ♂).
The specimen published by Aubert (1972: 148) as lectotype almost certainly came from Småland (as indicated by him!) and therefore cannot be a syntype. The lectotype designation is thus invalid.
Identity. ? *Pleolophus alutaceus* (Thomson). The two syntypes are not conspecific.

Microcryptus areolaris, 1883: 858. Syntypes 1 ♀, 2 ♂, SWEDEN: Skåne, Löparöd and Yddinge (UZI, Lund).
Labels. Löp [hand] (1 ♀). Yd [hand] (2 ♂).
Identity. *Javra areolaris* (Thomson) **comb. n.**

Microcryptus aries, 1883: 851. Syntypes 5 ♀, 2 ♂, SWEDEN: Lappland; Norrland; Småland; and Skåne, Ryssiöholm [= Rössjöholm] (UZI, Lund).
Labels. Smoland [printed]; Aries [Thomson cabinet label] (1 ♀). Smoland [printed] (2 ♀). Rhm [hand] (1 ♂). Norl. [printed] (1 ♀). [square of paper]; Smoland [printed] (1 ♂). Lap [hand]; Alcis [hand] (1 ♀).
Identity. *Schenkia aries* (Thomson) **comb. n.**

Microcryptus borealis, 1883: 862. Syntypes 1 ♀, 1 ♂, SWEDEN: Lappland (UZI, Lund).
Labels. Lpl. [printed]; borealis [Thomson cabinet label] (♀). Lpl. [printed] (♂).
Identity. *Aptesis borealis* (Thomson) **comb. n.**

Microcryptus distans, 1883: 864. Lectotype ♀, SWEDEN: Öland (UZI, Lund), by designation of Aubert, 1966: 129.
Labels. Ö. [printed]; distans [Thomson cabinet label].
Identity. *Aptesis distans* (Thomson).

Microcryptus femoralis, 1883: 853. Lectotype ♀, SWEDEN: Norrland (UZI, Lund), by designation of Aubert, 1972: 148.
Labels. Norl. [printed]; femoralis [Thomson cabinet label].
Identity. *Aptesis femoralis* (Thomson).

Microcryptus gravenhorsti, 1883: 854. Syntype 1 ♂, SWEDEN: Skåne, Ringsiön [= Ringsjön] (UZI, Lund).
Label. Rsiö [printed].
Identity. *Polytribax gravenhorsti* (Thomson) **comb. n.**

Microcryptus lapponicus, 1883: 862. Syntypes 2 ♀, SWEDEN: Lappland (UZI, Lund).
Labels. [square of paper]; [square of paper]; Lpl. [printed]; Lapponicus [Thomson cabinet label] (1 ♀). Lap [hand] (1 ♀).
Identity. *Aptesis lapponica* (Thomson) **comb. n.**

Microcryptus longicauda, 1883: 862. LECTOTYPE ♀, SWEDEN: Lappland, Lycksele (UZI, Lund), here designated (selected by J. F. Aubert).
Labels. Lycksele Lapp [hand]; longicauda [Thomson cabinet label].
Identity. *Cubocephalus longicauda* (Thomson) **comb. n.**

Microcryptus nigricornis, 1883: 860. Holotype ♀, SWEDEN: Skåne, Lund (UZI, Lund).
Labels. Lund [printed]; nigricornis [Thomson cabinet label].
Identity. *Oresbius nigricornis* (Thomson) **comb. n.**

Microcryptus nigritulus, 1885: 23. Syntypes ♀ ♂, FRANCE (lost).
This species is not present in the collection.
Identity. *Aptesis nigritula* (Thomson) (on the basis of specimens in the BMNH collection determined as this species by Schmiedeknecht).

Microcryptus opaculus, 1883: 851. Type(s) ♀, SWEDEN: Skåne, Wittsiö [= Vittsjö] (lost).
Identity. *Schenkia opacula* (Thomson).

Microcryptus orbitalis, 1883: 856. Syntypes 1 ♀, 1 ♂, SWEDEN: Skåne, Lund and Ringsiön [= Ringsjön] (UZI, Lund).
Labels. LD 28/6 ['LD' printed, date hand] (♀). [small green square] (♂).
Identity. *Aptesis orbitalis* (Thomson) **comb. n.**

Microcryptus ornaticeps, 1885: 23. Type(s) ♀, FRANCE: Paris (lost).
This species is not present in the collection.
Identity. Unknown, the name remains a *nomen dubium.*

Microcryptus pectoralis, 1888*b*: 1237. Syntypes 1 ♀, 1 ♂, SWEDEN: Skåne, Pålsjö (UZI, Lund).
Labels. Pål. [hand]; pectoralis [Thomson cabinet label] (♀). Pål. [hand] (♂).
Identity. *Aptesis pectoralis* (Thomson) **comb. n.**

Microcryptus puncticollis, 1883: 866. LECTOTYPE ♂, SWEDEN: Skåne, Ringsjön (UZI, Lund), here designated (selected by J. F. Aubert).
Label. Rsiö [printed].
Identity. *Aptesis puncticollis* (Thomson) **comb. n.**

Microcryptus punctifer, 1883: 860. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Aubert, 1966: 129.
Labels. L-d [printed]; punctifer [Thomson cabinet label].
Identity. Oresbius punctifer (Thomson) **comb. n.**

Microcryptus rubricollis, 1883: 853. Holotype ♀, NORWAY: Lillehammer (UZI, Lund).
Labels. Lhmr. 25.6.77 ['Lhmr.', printed; date, hand]; 24 [hand]; rubricollis [Thomson cabinet label].
Identity. Schenkia rubricollis (Thomson).

Microcryptus septentrionalis, 1883: 863. Holotype ♀, SWEDEN: Lappland (UZI, Lund).
Labels. Norl. [printed]; septentrionalis [Thomson cabinet label].
Identity. Oresbius septentrionalis (Thomson) **comb. n.**

Miomeris glabriventris, 1888*b*: 1317. Syntypes ♀ ♂, SWEDEN: Skåne, Yddinge (lost).
Identity. Microleptes glabriventris (Thomson) **comb. n.** (on the basis of material in the collection).

Miomeris rectangulus, 1888*b*: 1317. LECTOTYPE ♂, FRANCE: Bar-s-Seine (UZI, Lund), here designated (selected by J. F. Aubert).
Labels. Cartereau Bar-s-Seine [printed]; Gallia [printed]; rectangulus ♂. [hand] [on reverse of cabinet label: 'Aquisgrana'].
The type-locality is in northern rather than southern France as stated by Thomson. Presumably he made a mistake, if he did not the specimen cannot be a type.
Identity. Microleptes rectangulus (Thomson) **comb. n.**

Monoblastus angulatus, 1888*b*: 1256. Syntypes 3 ♀, 3 ♂. SWEDEN: Skåne, Pålsjö (UZI, Lund).
Labels. Pål. [hand]; angulatus [Thomson cabinet label] (1 ♀). Pål. [hand]; ♀ [printed] (1 ♀). Pål. [hand] (1 ♀, 1 ♂). Pålsiö [printed] (1 ♂). Pål. [hand]; ♂ [printed] (1 ♂).
Identity. Rhorus angulatus (Thomson).

Monoblastus longigena, 1883: 903. LECTOTYPE ♀, SWEDEN: Lappland (UZI, Lund), here designated (selected by R. Hinz).
Labels. Lpl. [printed]; longigena [Thomson cabinet label].
Identity. Rhorus longigena (Thomson).

Nemeritis caudatula, 1887*c*: 1119. Lectotype ♀, [? locality] (UZI, Lund), by designation of Aubert, 1972: 149.
Labels. f. 584 [hand]; caudatula [Thomson cabinet label].
Identity. Nemeritis caudatula Thomson.

Nemeritis convergens, 1887*c*: 1120. LECTOTYPE ♀, RUMANIA: Tăşnad (UZI, Lund), here designated (selected by K. Horstmann).
Labels. Tasnád 11.5.83 [locality, printed; date, hand]; convergens [Thomson cabinet label].
Identity. Cymodusa convergens (Thomson).

Nemeritis lativentris, 1887*c*: 1119. Lectotype ♀, SWEDEN: Gotland (UZI, Lund), by designation of Horstmann, 1973*a*: 11.
Label. G [hand].
Identity. Nemeritis lativentris Thomson.

Nemeritis stenura, 1887*c*: 1119. Lectotype ♀, SWEDEN: Öland (UZI, Lund), by designation of Aubert, 1972: 149.
Labels. Ö. [printed]; stenura [Thomson cabinet label].
Identity. Nemeritis stenura Thomson.

Nepiesta marginella, 1887*c*: 1117. Lectotype ♀, SWEDEN: Östergötland (UZI, Lund), by designation of Aubert, 1968: 195.
Labels. 153. [hand]; OG. [hand]; marginella [Thomson cabinet label].
Identity. Junior synonym of *Biolysia immolator* (Gravenhorst) (Horstmann, 1974*a*: 78). Townes (1970*b*: 164) places *Biolysia* as a synonym of *Bathyplectes*.

Nepiesta subclavata, 1887*c*: 1116. Lectotype ♀, FRANCE: Mt Noir (UZI, Lund), by designation of Horstmann, 1973*c*: 737.
Labels. Mt. Noir. [hand]; subclavata [Thomson cabinet label].
Identity. Nepiesta subclavata Thomson.

Notopygus mordax, 1883: 925. Holotype ♀, SWEDEN: Småland (UZI, Lund).
Labels. Smol [printed]; mordax [Thomson cabinet label].
Identity. Xenoschesis mordax (Thomson).

Notopygus (Homaspis) robustus, 1894: 1984. Holotype ♀, POLAND: Silesia (UZI, Lund).
Labels. Silesia [hand]; robusta [Thomson cabinet label].
The holotype lacks the gaster.
Identity. Homaspis robustus (Thomson).

Notopygus (Homaspis) varicolor, 1894: 1984. Holotype ♀, POLAND: Silesia (UZI, Lund).
Labels. Silesia Becker [hand]; varicolor [Thomson cabinet label].
Identity. Homaspis varicolor (Thomson).

Nyxeophilus nigricornis, 1885: 18. Type(s) ♀, FRANCE (lost).
This species is not present in the collection.
Identity. Xylophrurus nigricornis (Thomson) **comb. n.**

Odontomerus pinetorum, 1877: 777. Lectotype ♀, SWEDEN: Västergötland (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 119.
Label. V.G. [printed].
Identity. Junior synonym of *Odontocolon dentipes* (Gmelin) (Townes, Momoi & Townes, 1965: 119).

Odontomerus punctulatus, 1877: 777. Holotype ♀, SWEDEN: Småland (UZI, Lund).
Labels. Coll. L-gh. [printed]; punctulatus n [hand]; gracilis [Thomson cabinet label].
Identity. Odontocolon punctulatum (Thomson).

Odontomerus quercinus, 1877: 777. Lectotype ♀, SWEDEN: Öland (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 120.
Label. Ö. [printed].
Identity. Odontocolon quercinum (Thomson).

Oedimopsis [lapsus for *Oedemopsis*] ***limbata***, 1883: 907. Holotype ♀, SWEDEN: Skåne, Esperöd [= Äsperöd] (UZI, Lund).
Labels. Esp [printed]; limbata [Thomson cabinet label].
Identity. Oedemopsis limbata Thomson.

Olesicampa alboplica, 1887*c*: 1141. Syntype 1 ♂, SWITZERLAND (UZI, Lund).
Labels. 84.6. 599 [hand]; alboplica [Thomson cabinet label].
This specimen is not a holotype ('Type unique') as stated by Aubert (1966: 130). Thomson gives a range of length. Other syntypes may be in Kriechbaumer's collection.
Identity. Olesicampe alboplica (Thomson).

Olesicampa basalis, 1887*c*: 1143. Holotype ♀, SWEDEN: Småland, Kalmar (UZI, Lund).
Labels. Sm [hand]; ♀ [printed]; basalis [Thomson cabinet label].
Identity. Olesicampe basalis (Thomson).

Olesicampa binotata, 1887*c*: 1141. LECTOTYPE ♀, GERMANY (WEST): Aachen (UZI, Lund), here designated (selected by R. Hinz).
Label. Germ [hand].
The lectotype lacks the gaster. It was not missing when the lectotype was examined by Hinz in 1954 (R. Hinz, pers. comm.).
Identity. Olesicampe binotata (Thomson).

Olesicampa cavigena, 1887*c*: 1140. Lectotype ♀, SWEDEN: Skåne, Törringe (UZI, Lund), by designation of Aubert, 1966: 130.
Labels. Tör [hand]; ♀ [printed]; cavigena [Thomson cabinet label].
Identity. Olesicampe cavigena (Thomson).

Olesicampa crassitarsis, 1887*c*: 1146. LECTOTYPE ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), here designated (selected by R. Hinz).
Labels. Ört. [hand]; crassitarsis [Thomson cabinet label].
Identity. Olesicampe crassitarsis (Thomson).

Olesicampa femorella, 1887*c*: 1144. LECTOTYPE ♀, SWEDEN: Skåne, Esperöd [= Äsperöd] (UZI, Lund), here designated (selected by R. Hinz).
Labels. Fall. [hand]; femorator [hand]; femorella [Thomson cabinet label].
Identity. Olesicampe femorella (Thomson).

Olesicampa flavicornis, 1887*c*: 1143. LECTOTYPE ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), here designated (selected by R. Hinz).
Label. Pålsiö [printed].
Identity. *Olesicampe flavicornis* (Thomson).

Olesicampa fulcrans, 1887*c*: 1145. LECTOTYPE ♀, SWEDEN: Skåne, Äsperöd (UZI, Lund), here designated (selected by R. Hinz).
Labels. Esp 20/6 [hand]; fulcrans [Thomson cabinet label].
Identity. *Olesicampe fulcrans* (Thomson).

Olesicampa geniculella, 1887*c*: 1144. Holotype ♀, SWEDEN: Småland, Kalmar (UZI, Lund).
Labels. Kalm. [printed]; geniculella [Thomson cabinet label].
Identity. *Olesicampe geniculella* (Thomson).

Olesicampa gracilipes, 1887*c*: 1143. LECTOTYPE ♀, SWEDEN: Norrland (UZI, Lund), here designated (selected by R. Hinz).
Labels. Norl. [printed]; ♀ [printed].
Identity. *Olesicampe gracilipes* (Thomson).

Olesicampa luteipes, 1887*c*: 1147. LECTOTYPE ♀, SWEDEN: ? Blekinge (UZI, Lund), here designated (selected by R. Hinz).
Labels. Col Ljgh [printed]; ♀ [printed]; luteipes [Thomson cabinet label].
Identity. *Olesicampe luteipes* (Thomson).

Olesicampa nigricoxa, 1887*c*: 1145. LECTOTYPE ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), here designated (selected by R. Hinz).
Labels. Scan [printed]; ♀ [printed]; nigricoxa [Thomson cabinet label].
Identity. *Olesicampe nigricoxa* (Thomson).

Olesicampa nigroplica, 1887*c*: 1143. LECTOTYPE ♀, GERMANY (UZI, Lund), here designated (selected by R. Hinz).
Labels. I. 80 5.8 [hand]; nigroplica [Thomson cabinet label].
Identity. *Olesicampe nigroplica* (Thomson).

Olesicampa patellana, 1887*c*: 1140. LECTOTYPE ♀, FRANCE (UZI, Lund), here designated (selected by R. Hinz).
Labels. ♀ [printed]; Gall. [hand].
Identity. *Olesicampe patellana* (Thomson).

Olesicampa punctitarsis, 1887*c*: 1146. LECTOTYPE ♀, GERMANY (WEST): Bavaria (UZI, Lund), here designated (selected by R. Hinz).
Labels. 84. 537. [hand]; punctitarsis [Thomson cabinet label].
Identity. *Olesicampe punctitarsis* (Thomson).

Olesicampa radiella, 1887*c*: 1147. LECTOTYPE ♀, SWEDEN: Norrland (UZI, Lund), here designated (selected by R. Hinz).
Labels. Norl. [printed]; ♀ [printed].
Identity. *Olesicampe radiella* (Thomson).

Olesicampa retusa, 1887*c*: 1144. Lectotype ♀, SWEDEN: Skåne, Yddinge (UZI, Lund), by designation of Aubert, 1972: 149.
Labels. Yd. [hand]; retusa [hand]; retusa [Thomson cabinet label].
Identity. *Olesicampe retusa* (Thomson).

Olesicampa simplex, 1887*c*: 1147. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1966: 130.
Label. Pål [hand].
Identity. *Olesicampe simplex* (Thomson).

Olesicampa sternella, 1887*c*: 1146. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1972: 149.
Label. Pål [hand].
Identity. *Olesicampe sternella* (Thomson).

Olesicampa subcallosa, 1887*c*: 1146. Lectotype ♀, SWEDEN: Skåne, Alnarp (UZI, Lund), by designation of Aubert, 1972: 149.

Labels. Alp. [hand]; subcallosa [Thomson cabinet label].
Identity. Olesicampe subcallosa (Thomson).

Omorga angulata, 1887*c*: 1129. Lectotype ♀, SWEDEN: Skåne, Kungsmarken (UZI, Lund), by designation of Aubert, 1966: 130.
Label. Kgsm 10/7 [hand].
Identity. Campoplex angulatus (Thomson).

Omorga biloba, 1887*c*: 1126. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1972: 149.
Label. Pål [hand].
Identity. Campoplex bilobus (Thomson).

Omorga continua, 1887*c*: 1132. Lectotype ♀, SWEDEN: Gotland (UZI, Lund), by designation of Aubert, 1966: 130.
Labels. G. [hand]; continua [Thomson cabinet label].
Identity. Campoplex continuus (Thomson).

Omorga coracina, 1887*c*: 1130. Lectotype ♀, SWEDEN: Skåne, Fogelsång [= Fågelsång] (UZI, Lund), by designation of Jussila, 1965: 81.
Labels. Fogelsång [printed]; coracina [Thomson cabinet label].
Identity. Campoplex coracinus (Thomson).

Omorga exoleta, 1887*c*: 1127. Lectotype ♂, SWEDEN: Skåne, Ryssjöholm [= Rössjöholm] (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 275.
Labels. Rhm [hand]; exoleta [Thomson cabinet label].
Identity. Tranosema exoleta (Thomson) (Horstmann, 1977: 77).

Omorga forticosta, 1887*c*: 1131. Lectotype ♀, SWEDEN: Skåne, Pålsiö [= Pålsjö] (UZI, Lund), by designation of Aubert, 1966: 130.
Label. Pål [hand].
Identity. Campoplex forticosta (Thomson).

Omorga fusciplica, 1887*c*: 1127. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Aubert, 1968: 195.
Labels. L-d [printed]; fusciplica [Thomson cabinet label].
Identity. Campoplex fusciplica (Thomson).

Omorga fusicornis, 1887*c*: 1132. LECTOTYPE ♀, GERMANY (WEST): Aachen (UZI, Lund), here designated (selected by K. Horstmann).
Labels. Germ [printed]; fusicornis [Thomson cabinet label].
Identity. Campoplex fusicornis (Thomson) **comb. n.**

Omorga hadrocera, 1887*c*: 1134. Lectotype ♀, GERMANY (WEST): Aachen (UZI, Lund), by designation of Aubert, 1966: 130.
Labels. 19/8 38 [hand]; Germ. [hand].
Identity. Campoplex hadrocerus (Thomson).

Omorga liogaster, 1887*c*: 1130. Type(s) ♀, SWEDEN: Dalsland (lost).
The specimen recognised by Aubert (1966: 130) as holotype ('Type unique') cannot be a type because it comes from Bohuslän (label 'Bohl.'), as stated by Aubert!
Identity. Campoplex liogaster (Thomson) (Aubert, 1966: 130, on the basis of the supposed type).

Omorga litorea, 1887*c*: 1134. LECTOTYPE ♀, SWEDEN: Skåne, Lomma (UZI, Lund), here designated (selected by K. Horstmann).
Labels. Loma 20/7 [hand]; litorea [Thomson cabinet label].
Identity. Campoplex litoreus (Thomson).

Omorga lyrata, 1887*c*: 1128. Lectotype ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), by designation of Aubert, 1966: 130.
Label. Scan [printed].
Identity. Campoplex lyratus (Thomson).

Omorga melampus, 1887*c*: 1131. LECTOTYPE ♀, SWEDEN: Skåne, Degeberga (UZI, Lund), here designated (selected by R. Hinz).
Labels. Dgb. [hand]; melampus [Thomson cabinet label].
Identity. Campoplex melampus (Thomson) **comb. n.**

Omorga nigridens, 1887*c*: 1130. Lectotype ♀, SWEDEN: Skåne, Kungsmarken (UZI, Lund), by designation of Horstmann, 1977: 78.
Labels. Kgsm 10/7 [hand]; nigridens [Thomson cabinet label].
Identity. Tranosema nigridens (Thomson) (Horstmann, 1977: 78).

Omorga picticrus, 1887*c*: 1128. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Horstmann, 1977: 75.
Labels. Scan [printed]; picticrus [Thomson cabinet label].
Identity. Junior synonym of *Campoplex cerophagus* Gravenhorst (Horstmann, 1969: 421). Horstmann (1977) separates *Sesioplex* (including *cerophagus*) from *Campoplex*.

Omorga ruficoxa, 1887*c*: 1127. Lectotype ♀, HUNGARY [? CZECHOSLOVAKIA] (UZI, Lund), by designation of Aubert, 1968: 195.
Labels. -Ujhely. 13.6 [locality, printed; date, hand]; ruficoxa [Thomson cabinet label].
The locality on the label is probably Sátoraljaujhely, which is on the border between Czechoslovakia and Hungary. Its Czechoslovakian name is Slovenské Nové Mesto.
Identity. Campoplex ruficoxa (Thomson).

Omorga scaposa, 1887*c*: 1128. LECTOTYPE ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), here designated (selected by R. Hinz).
Labels. Pål. [hand]; scaposa [Thomson cabinet label].
Identity. Campoplex scaposus (Thomson) **comb. n.**

Omorga striolata, 1887*c*: 1131. Lectotype ♂, SWEDEN: Skåne, Ringsjön (UZI, Lund), by designation of Aubert, 1966: 130.
Label. Rsiö [printed].
Identity. Junior synonym of *Tranosema nigridens* (Thomson) (Horstmann, 1977: 78).

Ophion (Ophion) distans, 1888*b*: 1191. Lectotype ♀, SWEDEN: Stockholm (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 316.
Labels. Hlm. [printed]; Musko'n 8.1885 [hand]; Mortu [hand]; ♀ [hand]; 7. [hand].
Identity. Ophion distans Thomson.

Ophion (Ophion) longigena, 1888*b*: 1191. Lectotype ♂, SWEDEN: Skåne, Törringelund (UZI, Lund), by designation of Aubert, 1972: 148.
Label. Tn [hand, ? first letter].
The label on the lectotype is certainly not 'Sn' as stated by Aubert (1972: 148) and Sn was not used by Thomson as an abbreviation for Skåne, as far as is known.
Identity. Ophion longigena Thomson.

Ophion (Ophion) scutellaris, 1888*b*: 1192. Lectotype ♀, SWEDEN: Göteborg (UZI, Lund), by designation of Aubert, 1972: 148.
Labels. Gbg [hand]; scutellaris [Thomson cabinet label].
Identity. Ophion scutellaris Thomson.

Orthocentrus (Stenomacrus) compressus, 1897: 2436. Holotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund).
Labels. Hbg. [hand]; compressus Ths. [Thomson cabinet label].
Identity. Neurateles compressus (Thomson) **comb. n.**

Orthocentrus (Stenomacrus) crassicornis, 1897: 2434. Holotype ♀, GERMANY (UZI, Lund).
Labels. Mdsk. 21.V.84. [hand]; 28–39 [hand].
Identity. Neurateles crassicornis (Thomson) **comb. n.**

Orthocentrus (Stenomacrus) cubiceps, 1897: 2447. LECTOTYPE ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), here designated (selected by J. F. Aubert).
Label. Pål. [hand].
Identity. Stenomacrus cubiceps (Thomson).

Orthocentrus (Stenomacrus) curvulus, 1897: 2443. LECTOTYPE ♀, SWEDEN: Skåne, Fogelsång [= Fågelsång] (UZI, Lund), here designated (selected by J. F. Aubert).
Labels. Fg 556 [hand]; ♀ [printed]; curvulus [Thomson cabinet label].
Identity. Stenomacrus curvulus (Thomson).

Orthocentrus (Stenomacrus) deletus, 1897: 2442. LECTOTYPE ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), here designated (selected by J. F. Aubert).

Labels. Ört. [hand]; deletus [Thomson cabinet label].
Identity. *Stenomacrus deletus* (Thomson).

Orthocentrus (Stenomacrus) exserens, 1897: 2448. Lectotype ♀, SWEDEN: Skåne, Yddinge (UZI, Lund), by designation of Aubert, 1968: 195.
Labels. Yd. [hand]; exserens m [Thomson cabinet label].
Identity. *Stenomacrus exserens* (Thomson).

Orthocentrus (Stenomacrus) falcatus, 1897: 2435. LECTOTYPE ♀ SWEDEN: Skåne, Ringsjön (UZI, Lund), here designated (selected by J. F. Aubert).
Labels. Rsiö [printed]; ♀ [printed]; falcatus [Thomson cabinet label].
Identity. *Neurateles falcatus* (Thomson) **comb. n.**

Orthocentrus (Stenomacrus) flavicornis, 1897: 2439. Type(s) ♀, SWEDEN: Ostergötland (lost).
Identity. ? *Leipaulus flavicornis* (Thomson) **comb. n.**

Orthocentrus (Stenomacrus) fortipes, 1897: 2442. LECTOTYPE ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), here designated (selected by J. F. Aubert).
Label. Pålsiö [printed].
Identity. *Stenomacrus fortipes* (Thomson).

Orthocentrus (Stenomacrus) innotatus, 1897: 2449. Lectotype ♀, SWEDEN: Skåne, Degeberga (UZI, Lund), by designation of Aubert, 1968: 195.
Labels. Deg. [hand]; Deg. [hand]; innotatus [Thomson cabinet label].
Identity. *Stenomacrus innotatus* (Thomson).

Orthocentrus (Orthocentrus) petiolaris, 1897: 2428. Lectotype ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), by designation of Aubert, 1968: 195.
Labels. Rsiö [printed]; ♀ [printed]; petiolaris m [Thomson cabinet label].
Identity. *Orthocentrus petiolaris* Thomson.

Orthocentrus (Orthocentrus) radialis, 1897: 2430. Lectotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Aubert, 1978*a*: 24.
Label. Örtofta [printed].
Identity. *Orthocentrus radialis* Thomson.

Orthocentrus (Picrostigeus) recticauda, 1897: 2431. LECTOTYPE ♀, SWEDEN: Jemtland [= Jämtland], Åreskutan (UZI, Lund), here designated (selected by J. F. Aubert).
Labels. Norl. [printed]; anomalus H [Thomson cabinet label].
Identity. *Picrostigeus recticauda* (Thomson).

Orthocentrus (Stenomacrus) superus, 1897: 2443. LECTOTYPE ♀, SWEDEN: Skåne, Trelleborg (UZI, Lund), here designated (selected by J. F. Aubert).
Labels. Tbg 9/76 [hand]; superus [Thomson cabinet label].
Identity. *Stenomacrus superus* (Thomson).

Orthocentrus (Stenomacrus) ungula, 1897: 2436. Holotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund).
Labels. Pål [hand]; Ungula Ths [Thomson cabinet label].
Identity. *Stenomacrus ungula* (Thomson).

Oxytorus armatus, 1883: 910. Lectotype ♀, SWEDEN: Skåne, Pålsiö [= Pålsjö] (UZI, Lund), by designation of Kerrich, 1939: 127.
Label. Pål. [hand].
Identity. *Oxytorus armatus* Thomson.

Pachymerus puncticeps, 1877: 734. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 398.
Label. Lund [printed].
Identity. Junior synonym of *Collyria coxator* (Villers) (Townes, Momoi & Townes, 1965: 397, 398).

Pachymerus trichophthalmus, 1877: 734. Lectotype ♂, SWEDEN: Skåne, Ringsjön (UZI, Lund), by designation of Aubert, 1966: 127.
Label. [small green square].
Identity. *Collyria trichophthalma* (Thomson).

Paniscus brachycerus, 1888*b*: 1201. Lectotype ♀, Sweden: Skåne, Ilstorp (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 87.
Labels. Ilsp 28/6 [hand]; brachycerus [Thomson cabinet label].
Identity. Junior synonym of *Netelia dilatatus* (Thomson) (Delrio, 1975: 47).

Paniscus dilatatus, 1888*b*: 1200. Lectotype ♀ [not ♂ as stated by Aubert, 1972: 146], Sweden: Skåne, Degeberga (UZI, Lund), by designation of Aubert, 1972: 146.
Labels. Deg [hand]; dilatatus [Thomson cabinet label].
Identity. Netelia dilatatus (Thomson).

Paniscus gracilipes, 1888*b*: 1201. Lectotype ♂, Sweden: Skåne, Pålsjö (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 88.
Label. Pål [hand].
Identity. Junior synonym of *Netelia fuscicornis* (Holmgren) (Delrio, 1975: 51).

Paniscus melanurus, 1888*b*: 1199. Lectotype ♂, Sweden: Skåne, Pålsjö (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 89.
Label. Pål [hand].
Identity. Netelia melanurus (Thomson).

Paniscus ocellaris, 1888*b*: 1199. Lectotype ♀, Sweden: Östergöthland [= Östergötland], (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 90.
Labels. Ö.G. Bh [hand]; ocellaris m [hand]; ocellaris [Thomson cabinet label].
Identity. Netelia ocellaris (Thomson).

Paniscus opaculus, 1888*b*: 1199. Lectotype ♀, Sweden: Skåne, Lindholmen (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 92.
Labels. Lhn 23/7 [hand]; 360. [hand].
Identity. Netelia opaculus (Thomson).

Parabatus cristatus, 1888*b*: 1197. Lectotype ♀, Sweden: Skåne, Pålsjö (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 96.
Label. Pål [hand].
Identity. Netelia cristatus (Thomson).

Parabatus latungula, 1888*b*: 1196. Lectotype ♀, Sweden: Skåne, Pålsjö (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 98.
Label. Pål [hand].
Identity. Netelia latungulus (Thomson).

Parabatus nigricarpus, 1888*b*: 1196. Lectotype ♀, Sweden: Skåne, Ringsjön (UZI, Lund), by designation of Delrio, 1975: 39.
Labels. Pål [hand]; nigricarpus [Thomson cabinet label].
Identity. Netelia nigricarpus (Thomson).

Perilissus (Ecclinops) albitarsis, 1883: 914. Syntypes 1 ♀, 2 ♂, Sweden: Skåne, Ringsiön [= Ringsjön] (UZI, Lund).
Labels. [small green square] (1 ♀ 1 ♂). [small green square]; 330. [hand] (1 ♂).
Identity. Perilissus albitarsis Thomson.

Perilissus (Ecclinops) compressus, 1883: 914. Holotype ♀, Sweden: Skåne, Söfdeborg [= Sövdeborg] (UZI, Lund).
Labels. Sbg 28/7 [hand]; compressus [Thomson cabinet label].
Identity. Perilissus compressus Thomson.

Perilissus (Spanotecnus) coxalis, 1883: 912. Syntype 1 ♀, Sweden: Skåne, Arrie (UZI, Lund).
Label. Ar [hand].
Identity. Perilissus coxalis Thomson.

Perilissus (Ecclinops) emarginatus, 1883: 914. Syntype 1 ♂, Sweden: Skåne, Ringsiön [= Ringsjön] (UZI, Lund).
Labels. [small green square]; 186. [hand].
Identity. Perilissus emarginatus Thomson.

Perilissus (Ecclinops) frontator, 1883: 914. Type(s) [? sex]. Sweden: Skåne, Holmeja (lost).
Identity. Perilissus frontator Thomson.

Perilissus (Polyoncus) grandiceps, 1883: 913. Lectotype ♂, SWEDEN: Skåne, Arrie (UZI, Lund), by designation of Aubert, 1966: 127.
Labels. Ar 6/56 [hand]; grandiceps [Thomson cabinet label].
Identity. Lathrolestes grandiceps (Thomson).

Perilissus (Luphyroscopus) nigricollis, 1883: 915. Syntypes 3 ♀, 3 ♂, SWEDEN: Skåne, Helsingborg, Örtofta, Arrie and Pålsjö (UZI, Lund).
Labels. Hbg. [hand]; nigricollis [Thomson cabinet label] (1 ♀). Ört. [hand] (2 ♀ 1 ♂). Ar. [hand] (1 ♂). Pål. [hand] (1 ♂).
Identity. Lathrolestes nigricollis (Thomson) **comb. n.**

Perilissus (Perilissus) spiniger, 1883: 912. Holotype ♂, SWEDEN: Skåne, Holmeja (UZI, Lund).
Label. Yd [hand].
Identity. Perilissus spiniger Thomson.

Pezomachus (Pezomachus) breviceps, 1884: 1017. Syntypes ♀ ♂, SWEDEN: Skåne, Skanör (lost).
Identity. Gelis breviceps (Thomson).

Pezomachus (Pezomachus) gonatopinus, 1884: 1008. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Aubert, 1972: 148.
Label. Pål [hand].
Aubert incorrectly referred to the species as *Gelis gonatopinus.*
Identity. Gelis gonatopinus (Thomson).

Pezomachus (Pezomachus) grandiceps, 1884: 1007. Syntype 1 ♂, ? syntype 1 ♀, SWEDEN: Skåne, Degeberga (UZI, Lund).
Labels. Deg [hand]; grandiceps [Thomson cabinet label] (♂). 172. [hand]; Scania [printed] (♀).
The female specimen is only tentatively recognised as a syntype because it lacks precise locality data.
Identity. Gelis grandiceps (Thomson).

Pezomachus (Pezomachus) mandibularis, 1884: 1009. Syntypes 14 ♀, 10 ♂, SWEDEN: Skåne, Bökeberg, Helsingborg, Lindholmen, Pålsjö and Yddinge (UZI, Lund).
No notes were made of individual specimen labels.
Identity. Gelis mandibularis (Thomson).

Pezomachus (Pezomachus) myrmecinus, 1884: 1001. Syntypes 11 ♀, 1 ♂, SWEDEN: Skåne, Skanör, Lund, Lomma and Fågelsång; and Öland (UZI, Lund).
No notes were made of individual specimen labels.
Identity. Gelis myrmecinus (Thomson).

Pezomachus numidicus, 1885: 32. Type(s) ♀, ALGERIA (lost).
Horstmann (1979*a*: 297) has searched for this species in the Fairmaire collection in Paris, but without success.
Identity. Unknown, the name remains a *nomen dubium.*

Pezomachus (Pezolochus) pilosulus, 1884: 1003. LECTOTYPE ♀, SWEDEN: Skåne, Lund (UZI, Lund), here designated (selected by K. Horstmann).
Labels. Lund [printed]; pilosulus [Thomson cabinet label].
Identity. Gelis pilosulus (Thomson) **comb. n.**

Pezomachus (Pezomachus) spinula, 1884: 1006. Syntype 1 ♂, SWEDEN: Skåne, Lund (UZI, Lund).
Labels. ♂ [printed]; L-d [printed].
Identity. Gelis spinulus (Thomson).

Phaeogenes (Phaeogenes) crassidens, 1891: 1644. Syntypes 2 ♀, SWEDEN: Skåne, Ryssjöholm [= Rössjöholm] (UZI, Lund).
Labels. Rshm 16/6 [hand] (1 ♀). Rhm [hand] (1 ♀).
Identity. Phaeogenes crassidens Thomson.

Phaeogenes (Proscus) elongatus, 1891: 1651. Lectotype ♀, DENMARK: Sønderborg (UZI, Lund), by designation of Aubert, 1966: 128.
Labels. Sandb'g. 19.5.86 [hand]; elongatus m [Thomson cabinet label].
Identity. Phaeogenes elongatus Thomson.

Phaeogenes (Phaeogenes) montanus, 1891: 1652. Holotype ♀, Czechoslovakia: Altvater [= Praděd] (UZI, Lund).
Labels. Altvater [hand]; montanus m [Thomson cabinet label].
Identity. Phaeogenes montanus Thomson.

Phaeogenes (Phaeogenes) ruficoxa, 1891: 1648. Lectotype ♀, Sweden: Skåne, Ringsjön (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 416.
Label. Ringsiö [printed].
A second lectotype designation (of another specimen) published by Aubert (1966: 128) is invalid.
Identity. Dirophanes ruficoxa (Thomson).

Phaeogenes (Phaeogenes) tegularis, 1891: 1656. Holotype ♀, Sweden: Lappland (UZI, Lund).
Labels. Lap [hand]; tegularis [Thomson cabinet label].
Identity. Phaeogenes tegularis Thomson.

Phaestus heterocerus, 1894: 2017. LECTOTYPE ♀, Sweden: Skåne, Pålsjö (UZI, Lund), here designated (selected by H. K. Townes).
Labels. Pål. [hand]; heterocerus [Thomson cabinet label].
Identity. Junior synonym of *Phaestus anomalus* (Brischke) (Townes, 1970*b*: 74).

Phobetus (Phobetus) femorator, 1894: 1986. Lectotype ♀, Denmark: Sønderborg (UZI, Lund), by designation of Aubert, 1966: 127.
Label. Sandb'g. VI.91. [hand].
Identity. Phobetes femorator (Thomson).

Phobetus (Ipoctonus) fulviventris, 1894: 1987. Holotype ♀, Sweden: Bohuslän (UZI, Lund).
Labels. Bohl. [printed]; fulviventris [Thomson cabinet label].
Identity. Phobetes fulviventris (Thomson) **comb. n.**

Phobetus (Ipoctonus) latipes, 1894: 1987. Holotype ♂, Sweden: Skåne, Kjellby [= Källby] (UZI, Lund).
Labels. Källby 2 Jul. 30. [hand]; latipes [hand].
Identity. Phobetes latipes (Thomson) **comb. n.**

Phobetus (Ipoctonus) rufipes, 1894: 1987. Syntypes ♀♂, Sweden: Skåne, Pålsjö (lost).
Identity. Phobetes rufipes (Thomson) **comb. n.** (on the basis of specimens in the collection).

Phobocampa alticollis, 1887*c*: 1121. Lectotype ♀, Germany (UZI, Lund), by designation of Aubert, 1968: 195.
Labels. Germ [hand]; alticollis [Thomson cabinet label].
Identity. Phobocampe alticollis (Thomson).

Phobocampa confusa, 1887*c*: 1122. ? Syntype 1 ♀, ? Germany (UZI, Lund).
Label. Kalnh. 27/6. 84. [hand].
This specimen is probably a syntype but it has not been possible to discover the meaning of the locality abbreviation 'Kalnh.' (the last letter could be 'p'). The species was described from Germany. The only other specimen in the collection is from Loos (near Lille in France) and cannot therefore be a syntype.
Identity. Phobocampe confusa (Thomson).

Phobocampa flavicincta, 1887*c*: 1122. LECTOTYPE ♀, Sweden: Skåne, Ringsjön (UZI, Lund), here designated (selected by R. W. Carlson).
Label. Scan lac [printed].
Identity. Phobocampe flavicincta (Thomson).

Phobocampa pulchella, 1887*c*: 1121. LECTOTYPE ♀, Sweden: Skåne, Fogelsång [= Fågelsång] (UZI, Lund), here designated (selected by R. W. Carlson).
Label. Lund [printed].
Identity. Phobocampe pulchella (Thomson).

Phygadeuon acutipennis, 1884: 954. Syntypes ♀♂, Sweden: Skåne, Stehag (lost).
Identity. ? *Phygadeuon acutipennis* Thomson (Frilli, 1973: 95).

Phygadeuon annulicornis, 1884: 947. Lectotype ♀, Sweden: Skåne, Ringsjön (UZI, Lund), by designation of Aubert, 1972: 148.
Labels. [small green square]; annulicornis [Thomson cabinet label].
Identity. Theroscopus annulicornis (Thomson) (Frilli, 1973: 95).

Phygadeuon anurus, 1884: 946. Lectotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Frilli, 1973: 95.
Labels. Ortofta [printed]; ♀ [printed]; anurus [Thomson cabinet label].
Identity. *Ceratophygadeuon anurus* (Thomson).

Phygadeuon armatulus, 1888*b*: 1240. Lectotype ♀, SWEDEN: Skåne, Fogelsång [= Fågelsång] (UZI, Lund), by designation of Frilli, 1973: 96.
Labels. Fogelsång [printed]; armatulus n [Thomson cabinet label].
Identity. *Medophron armatulus* (Thomson).

Phygadeuon bidens, 1884: 958. Lectotype ♀, SWEDEN: Skåne, Ringsiön [= Ringsjön] (UZI, Lund), by designation of Frilli, 1973: 96.
Labels. [small green square]; bidens [Thomson cabinet label].
Identity. *Phygadeuon bidens* Thomson.

Phygadeuon brachyurus, 1884: 955. Lectotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Jussila, 1965: 141.
Label. Ort. [hand].
Identity. *Phygadeuon brachyurus* Thomson.

Phygadeuon brevitarsis, 1884: 959. Lectotype ♀, SWEDEN: Skåne, Ringsiön [= Ringsjön] (UZI, Lund), by designation of Frilli, 1973: 97.
Label. Rsiö [printed].
Identity. *Phygadeuon brevitarsis* Thomson.

Phygadeuon canaliculatus, 1889: 1406. Syntypes ♀ ♂, SWEDEN: Skåne, Pålsjö (lost).
Identity. ? *Phygadeuon canaliculatus* Thomson (Frilli, 1973: 97).

Phygadeuon caudatus, 1884: 946. Lectotype ♀, SWEDEN: Lappland (UZI, Lund), by designation of Frilli, 1973: 97.
Labels. Lap [hand]; caudatus [Thomson cabinet label].
Identity. Junior secondary homonym of *Medophron caudatus* (Provancher). Replacement name *Medophron caudatulus* (Dalla Torre).

Phygadeuon cubiceps, 1884: 961. Syntypes ♀, SWEDEN: Skåne, Törringe (lost).
The specimen designated as lectotype by Horstmann (1967*a*: 15) (and also recognised as such by Aubert (1968: 195) and Frilli (1973: 97)) is from Yddinge (label 'Yd'). Although Thomson often 'bracketed' together adjacent localities it seems to be unlikely that he would have done so in this case, especially as he states 'vid Törringe nära Malmö'. Törringe and Yddinge are about 6 km apart. Therefore, I do not think the 'lectotype' can have been a syntype, unless Thomson misquoted the locality.
Identity. *Phygadeuon cubiceps* Thomson.

Phygadeuon curviscapus, 1889: 1405. Holotype ♀, SWEDEN: Skåne, Pålsjö (lost).
The female specimen designated as lectotype by Frilli (1973: 98) is on the same pin as a male specimen. Since Thomson specified 'Ett exemplar' (that is, a holotype) it seems highly unlikely that the specimen concerned was on the same pin as a male. Therefore, I do not think the 'lectotype' can be the original specimen.
Identity. *Phygadeuon curviscapus* Thomson (on the basis of the invalid 'lectotype').

Phygadeuon curvispina, 1884: 948. Lectotype ♂, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Frilli, 1973: 98.
Label. Lund [printed].
I do not regard the lectotype designation published by Aubert (1966: 129) as valid because he failed to indicate (in both his publication and labels attached to the specimen) which syntype was selected. There are five specimens (and the remains of a sixth) on one pin. From the top of the pin the specimens are: 1, paralectotype ♂; 2, remains (head) of a paralectotype [? sex]; 3, lectotype ♂; 4, paralectotype ♀; 5, paralectotype ♂; 6, paralectotype ♂.
Identity. *Stibeutes curvispina* (Thomson).

Phygadeuon dimidiatus, 1884: 963. Lectotype ♀, SWEDEN: Skåne, Klinta (UZI, Lund), by designation of Frilli, 1973: 98.
Labels. [small green square]; dimidiatus [Thomson cabinet label].
Identity. *Phygadeuon dimidiatus* Thomson.

Phygadeuon facialis, 1884: 952. Lectotype ♀, SWEDEN: Skåne, Esperöd [= Äsperöd] (UZI, Lund), by designation of Frilli, 1973: 98–99.

Labels. Esp [printed]; facialis [Thomson cabinet label].

Identity. Junior primary homonym of *Phygadeuon facialis* Gravenhorst. Replacement name *Theroscopus faciator* (Aubert) (Frilli, 1973: 98).

Phygadeuon flavicans, 1884: 961. Lectotype ♂, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Aubert, 1966: 129.

Label. Ld [hand].

Identity. Phygadeuon flavicans Thomson.

Phygadeuon flavipes, 1888*b*: 1238. Lectotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Frilli, 1973: 99.

Label. Ört [hand].

Identity. Junior secondary homonym of *Phygadeuon flavipes* (Provancher) (described in *Mesostenus* and currently placed in *Grypocentrus*). Replacement name *Medophron flavitarsis* (Dalla Torre).

Phygadeuon grandiceps, 1884: 950. Lectotype ♂ [not ♀ as stated by Townes, Momoi & Townes, 1965: 145], SWEDEN: Skåne, Pålsiö [= Pålsjö] (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 145.

Label. Pål [hand].

Identity. Phygadeuon grandiceps Thomson.

Phygadeuon grandis, 1884: 940. Lectotype ♀, SWEDEN: Norrland (UZI, Lund), by designation of Frilli, 1973: 100.

Label. Norl. [printed].

Identity. Pygocryptus grandis (Thomson).

Phygadeuon heterogaster, 1885: 22. Type(s) ♀, FRANCE (lost).

Identity. ? *Phygadeuon heterogaster* Thomson.

Phygadeuon heteropus, 1896: 2387. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Frilli, 1973: 100.

Label. Pål [hand].

Identity. Dichrogaster heteropus (Thomson).

Phygadeuon inflatus, 1884: 959. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 145.

Label. L-d [printed].

Identity. Junior secondary homonym of *Phygadeuon inflatus* (Provancher) (described in *Ichneumon* and currently placed in *Endasys*). Replacement name *Phygadeuon infelix* Dalla Torre. Use of this replacement name would be contrary to existing usage (which is *Phygadeuon inflatus* (e.g. Horstmann, 1967*a*: 10)), which should be maintained pending reference to the International Commission under Article 59(b)(i) of the *Code* (as amended, *Bull. zool. Nom.* **31** (1974): 83).

Phygadeuon laeviventris, 1884: 955. Lectotype ♀, SWEDEN: Skane, Lund (UZI, Lund), by designation of Jussila, 1965: 141.

Labels. Ld [hand]; laeviventris [Thomson cabinet label].

Identity. Phygadeuon laeviventris Thomson.

Phygadeuon lapponicus, 1884: 952. Lectotype ♀, SWEDEN: Lappland (UZI, Lund), by designation of Jussila, 1965: 143.

Label. Lap [hand].

Identity. Phygadeuon lapponicus Thomson.

Phygadeuon liogaster, 1884: 949. Lectotype ♀, NORWAY (UZI, Lund), by designation of Frilli, 1973: 101.

Labels. 205 [hand]; Norv [hand]; liogaster [Thomson cabinet label].

Identity. Phygadeuon liogaster Thomson.

Phygadeuon liosternus, 1884: 1040. Syntype 1 ♂, SWEDEN: Skåne, Örtofta (UZI, Lund).

Label. Ört. [hand].

Frilli (1973: 101–102) considered that the male from Örtofta did not agree with the original description and could not, therefore, be a syntype. I believe that there is sufficient agreement for it to be a syntype.

Identity. Phygadeuon liosternus Thomson.

Phygadeuon longiceps, 1884: 946. Syntype 1 ♂, SWEDEN: Skåne, Lund (UZI, Lund).

Label. L-d 14/6 [hand].

Frilli (1973: 102) considered that the male recognised here as a syntype was not in agreement with the original description and he designated a neotype ♀ for this species. If Frilli's neotype designation is considered to fulfil the provisions of Article 75 of the *Code* and to be 'valid' then the case must be referred to the International Commission (Article 75(f)).

Identity. *Ceratophygadeuon longiceps* (Thomson).

Phygadeuon longigena, 1884: 947. Lectotype ♀, SWEDEN: Skåne (UZI, Lund), by designation of Frilli, 1973: 102.

Labels. Scan [printed]; longigena [Thomson cabinet label].

Identity. *Phygadeuon longigena* Thomson.

Phygadeuon monodon, 1884: 950. Syntype 1 ♀, SWEDEN: Skåne, near Hellestad [= Hällestad] (UZI, Lund).

Label. Dahlby [hand].

Dahlby [= Dalby] is not far from Hällestad and assuming that the specimen was not collected in the town itself it seems reasonable to suppose that it is a syntype. Aubert's publication of a 'neotype' for this species (1966: 129) is not valid because it does not comply with the provisions of Article 75(c) of the *Code*.

Identity. *Phygadeuon monodon* Thomson.

Phygadeuon ochrogaster, 1888*b*: 1241. Syntypes ♀, SWEDEN: Skåne, Ryssjöholm [= Rössjoholm] (lost).

The specimen designated as lectotype by Frilli (1973: 103) cannot be a syntype—it is from Kungsmarken near Lund and is labelled 'Kgsm' not 'Rysm' as stated by Frilli.

Identity. *Theroscopus ochrogaster* (Thomson) (Frilli, 1973: 103, on the basis of the invalid 'lectotype').

Phygadeuon ocularis, 1889: 1405. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Horstmann, 1967*a*: 11.

Labels. Pål [hand]; ocularis m [Thomson cabinet label].

Identity. *Phygadeuon ocularis* Thomson.

Phygadeuon oppositus, 1884: 960. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Jussila, 1965: 142.

Label. Lund [printed].

Identity. *Phygadeuon oppositus* Thomson.

Phygadeuon ovalis, 1884: 963. Lectotype ♀, SWEDEN: Skåne, Stehag (UZI, Lund), by designation of Aubert, 1966: 129.

Labels. [green square]; ovalis [Thomson cabinet label].

Identity. Junior primary homonym of *Phygadeuon ovalis* Provancher. Replacement name *Phygadeuon ovaliformis* Dalla Torre.

Phygadeuon pallicarpus, 1884: 947. Lectotype ♀, SWEDEN: Skåne, Fogelsång [= Fågelsång] (UZI, Lund), by designation of Frilli, 1973: 104.

Labels. Fsg 18/5 [hand]; pallicarpus [Thomson cabinet label].

Frilli (1973: 104) misspelled the name *pallidicarpus*. This unjustified emendation was first used by Dalla Torre (1902: 690).

Identity. *Phygadeuon pallicarpus* Thomson.

Phygadeuon parvicauda, 1885: 20. Syntypes ♀, FRANCE: Marchiennes (lost).

Aubert's publication of a neotype female (1966: 129) for this species is not valid because it does not comply with the provisions of Article 75(c) of the *Code*.

Identity. Junior synonym of *Ceratophygadeuon anurus* (Thomson) (Horstmann, 1979*b*: 45).

Phygadeuon parvipennis, 1884: 944. Lectotype ♂, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Frilli, 1973: 104.

Label. Lund [printed].

Identity. *Arotrephes parvipennis* (Thomson).

Phygadeuon pimplarius, 1884: 941. Lectotype ♀, SWEDEN: Skåne, Öfvedskloster [= Övedskloster] (UZI, Lund), by designation of Frilli, 1973: 105.

Label. Öke Å [hand].

Identity. *Lochetica pimplaria* (Thomson).

Phygadeuon punctigena, 1884: 953. Lectotype ♀, SWEDEN: Skåne, Alnarp (UZI, Lund), by designation of Frilli, 1973: 105.
Labels. Alp [hand]; punctigena [Thomson cabinet label].
Identity. Phygadeuon punctigena Thomson.

Phygadeuon punctipleuris, 1884: 962. Lectotype ♀, SWEDEN: Skåne, Pålsiö [= Pålsjö] (UZI, Lund), by designation of Frilli, 1973: 105.
Label. Pål [hand].
Identity. Phygadeuon punctipleuris Thomson.

Phygadeuon punctiventris, 1884: 955. Lectotype ♀, SWEDEN: Skåne, Klinta (UZI, Lund), by designation of Aubert, 1966: 129.
Label. [small green square].
I do not agree with Frilli that an earlier publication by Aubert (1965: 564) constitutes a valid lectotype designation.
Identity. Phygadeuon punctiventris Thomson.

Phygadeuon recurvus, 1884: 943. Syntypes ♀, SWEDEN: Skåne, Klinta (lost).
The specimen designated as lectotype by Frilli (1973: 106) is from Herrevadskloster (label 'Hkl 6/74') and it cannot, therefore, be a syntype. A male in the collection could be from the type-locality but the original description is restricted to females.
Identity. Medophron recurvus (Thomson) (Frilli, 1973: 106, on the basis of the invalid 'lectotype').

Phygadeuon ripicola, 1885: 19. Lectotype ♂, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Frilli, 1973: 106.
Label. Örtofta [printed].
Thomson 'redescribed' this species in the *Opuscula Entomologica* (1888*b*: 1242).
Identity. Phygadeuon ripicola Thomson.

Phygadeuon rotundipennis, 1884: 963. Lectotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Horstmann, 1967*a*: 15.
Label. Ört. [hand].
Identity. Phygadeuon rotundipennis Thomson.

Phygadeuon rugipectus, 1884: 1040. Lectotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Frilli, 1973: 107.
Labels. Ortofta [printed]; rugipectus [Thomson cabinet label].
Identity. Phygadeuon rugipectus Thomson.

Phygadeuon scaposus, 1884: 961. Lectotype ♀, SWEDEN: Skåne, Pålsiö [= Pålsjö] (UZI, Lund), by designation of Aubert, 1966: 129.
Labels. Hbg [hand]; scaposus [Thomson cabinet label].
Identity. Phygadeuon scaposus Thomson.

Phygadeuon stilpninus, 1888*b*: 1239. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Frilli, 1973: 107.
Labels. Pål. [hand]; Stilpninus [Thomson cabinet label].
Identity. Phygadeuon stilpninus Thomson.

Phygadeuon submuticus, 1884: 962. Holotype ♀, SWEDEN: Skåne, Stehag (UZI, Lund).
Labels. Rsiö [printed]; submuticus [Thomson cabinet label].
The holotype is the specimen referred to as 'neotype' by Aubert (1966: 129) and Frilli (1973: 107).
Identity. Phygadeuon submuticus Thomson.

Phygadeuon tenuicosta, 1884: 957. Lectotype ♀, SWEDEN: Skåne, Ringsiön [= Ringsjön] (UZI, Lund), by designation of Frilli, 1973: 108.
Labels. Rsiö [printed]; tenuicosta [Thomson cabinet label].
Identity. Phygadeuon tenuicosta Thomson.

Phygadeuon tenuiscapus, 1884: 960. Lectotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Aubert, 1968: 195.
Labels. Ört. [hand]; tenuiscapus [Thomson cabinet label].
Identity. Phygadeuon tenuiscapus Thomson.

Phygadeuon trichops, 1884: 962. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Horstmann, 1967*a*: 11.
Label. L-d [printed].
Identity. Phygadeuon trichops Thomson.

Phygadeuon ungularis, 1884: 951. Syntypes 1 ♀, 7 ♂, SWEDEN: Skåne, Örtofta and Skabersiö [= Skabersjö] (UZI, Lund).
Labels. Örtofta [printed] (2 ♂). Ört. [hand] (1 ♀ 3 ♂). Ört 5/VI [hand] (1 ♂). Skb [hand] (1 ♂).
Frilli (1973: 108–109) thought that none of the specimens standing under this name agreed with the original description. I believe that the eight specimens noted above are in sufficient agreement with the description to be considered syntypes.
Identity. I believe this species belongs in *Theroscopus*. However, because of some uncertainty and because it would create problems of secondary homonymy I am leaving it in *Phygadeuon*.

Phygadeuon varicornis, 1885: 21. Syntypes ♀ ♂, FRANCE: le Crotoy (lost).
Identity. ? *Phygadeuon varicornis* Thomson.

Phytodietus continuus, 1877: 773. Lectotype ♀, SWEDEN: Skåne, Fågelsång (UZI, Lund), by designation of Kerrich, 1962: 50–51.
Labels. Fsg 7/7 [hand]; continuus [Thomson cabinet label].
Identity. Junior synonym of *Phytodietus obscurus* Desvignes (Kerrich, 1962: 50).

Phytodietus crassitarsis, 1877: 774. Lectotype ♀, SWEDEN: Skåne, Ilstorp (UZI, Lund), by designation of Šedivý, 1961: 41.
Labels. Ilsp 12/7 [hand]; crassitarsus [Thomson cabinet label].
Identity. Phytodietus crassitarsis Thomson.

Phytodietus geniculatus, 1877: 774. Lectotype ♀, SWEDEN: Skåne, Båstad (UZI, Lund), by designation of Šedivý, 1961: 41.
Label. [small pinkish square].
Identity. Phytodietus geniculatus Thomson.

Phytodietus rubricosus, 1877: 773. Lectotype ♀, SWEDEN: Skåne, Lindholmen (UZI, Lund), by designation of Tolkanitz, 1973: 880.
Labels. Lhn 9/8 [hand]; 192. [hand].
Identity. Junior synonym of *Phytodietus ornatus* Desvignes (Tolkanitz, 1973: 880).

Pimpla brachycera, 1894: 2126. Lectotype ♀, ITALY: Trieste (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 9.
Labels. 9.X Triest. [date, hand; locality, printed]; brachycera m [Thomson cabinet label].
Identity. Junior synonym of *Exeristes roborator* (Fabricius) (Townes, Momoi & Townes, 1965: 9).

Pimpla (Itoplectis) clavicornis, 1889: 1409. Holotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund).
Labels. Pål. [hand]; clavicornis [Thomson cabinet label].
Identity. Itoplectis clavicornis (Thomson).

Pimpla flavicoxis, 1877: 747. Lectotype ♀, SWEDEN: Norrland (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 47.
Label. Norl. [printed].
Identity. Pimpla flavicoxis Thomson.

Pimpla laevifrous, 1877: 750. Lectotype ♀, SWEDEN: Norrland (UZI, Lund), by designation of Aubert, 1972: 145.
Labels. Norl [printed]; laevifrons [Thomson cabinet label].
Authors since Thomson (for example, Oehlke, 1967: 34; Aubert, 1969: 98, 1972: 145) have chosen to alter the spelling of the name to *laevifrons* and there is evidence (Thomson's own cabinet label) that this is what was intended. However, a strict interpretation of Article 32(a)(ii) of the *Code* (as amended, *Bull. zool. Nom.* **31** (1974): 83) suggests that the original spelling should be retained.
Identity. Delomerista laevifrous (Thomson).

Pimpla longiceps, 1877: 746. Syntypes 2 ♀, 1 ♂, SWEDEN: Lappland (UZI, Lund).
Labels. Lpl. [printed]; longiceps [Thomson cabinet label] (1 ♀). Lpl. [printed] (1 ♀ 1 ♂).
Identity. Junior synonym of *Pimpla sodalis* Ruthe (Perkins, 1941: 645).

Pimpla nigricans, 1877: 754. Lectotype ♀, SWEDEN: Skåne (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 11.
Label. Scan [printed].
Identity. Scambus nigricans (Thomson).

Pimpla nigriscaposa, 1877: 755. Syntypes 15 ♀, 7 ♂, SWEDEN: [various localities] (UZI, Lund).
All specimens standing under this name except for two from Trieste (almost certainly added to the collection after 1877) and a braconid (on the same pin as a female syntype) are regarded as syntypes. Details of individual labels were not noted.
Identity. Junior synonym of *Scambus brevicornis* (Gravenhorst) (Perkins, 1943*a*: 268).

Pimpla ovalis, 1877: 748. Holotype ♀, SWEDEN: Skåne, Ilstorp (UZI, Lund).
Labels. Ilsp 12/7 [hand]; 90. [hand]; ovalis [Thomson cabinet label].
Identity. Junior synonym of *Itoplectis viduata* (Gravenhorst) (Perkins, 1941: 646).

Pimpla parallela, 1877: 752. Holotype ♀, SWEDEN: Nerike [= Närke] (lost).
Identity. Junior synonym of *Tromatobia ovivora* (Boheman) (Oehlke, 1967: 18).

Pimpla pictifrons, 1877: 757. Lectotype ♀, SWEDEN: Skåne, Torekov (UZI, Lund), by designation of Šedivý, 1963: 246.
Label. Tkov 7/60 [hand]
Identity. Dreisbachia pictifrons (Thomson).

Pimpla punctata, 1894: 2126. Syntype 1 ♀, AUSTRIA: 'Steiermarks alper' (UZI, Lund).
Label. Alpes styriaiae [hand].
Identity. Junior synonym of *Exeristes roborator* (Fabricius) (Perkins, 1943*a*: 261).

Pimpla punctiventris, 1877: 756. Syntypes 16 ♀, 11 ♂, 3 ?sex, SWEDEN: Skåne, [various localities] (UZI, Lund).
Thomson stated that this species was 'Sällsynt i Skåne'. It therefore seems unlikely that all the Skåne specimens standing under this name date from 1877. However, in the absence of any evidence with which to distinguish the syntypes, all are regarded as such. Details of individual labels were not noted. In addition to the syntypes there is one female from Östergötland.
Identity. Junior synonym of *Scambus brevicornis* (Gravenhorst) (Perkins, 1943*a*: 268).

Pimpla quadridentata, 1877: 749. Lectotype ♀, SWEDEN: Skåne (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 45.
Labels. Scan [printed]; 4-dentata [Thomson cabinet label].
Identity. Apechthis quadridentata (Thomson).

Pimpla stenostigma, 1877: 755. Syntypes 2 ♀, 2 ♂, SWEDEN: Öland and Skåne, Ringsjön (UZI, Lund).
Labels. [small green square] (1 ♀). Ö. [printed] (1 ♀ 2 ♂).
Identity. Junior synonym of *Acropimpla pictipes* (Gravenhorst) (Perkins, 1943*a*: 267).

Pimpla strigipleuris, 1877: 747. Syntypes 12 ♀, 4 ♂, SWEDEN: Skåne, [various localities] (UZI, Lund).
Similar comments apply as for *Pimpla punctiventris* (see above). Details of individual labels were not noted. In addition to the syntypes there are two males (one without locality, the other from Uppland) and one female (from Trieste).
Identity. Junior synonym of *Pimpla spuria* Gravenhorst (Perkins, 1941: 645).

Pimpla tricineta, 1877: 748. Lectotype ♀, SWEDEN: Skåne, Reften (UZI, Lund), by designation of Aubert, 1968: 194.
Labels. Rfn 10/7 [hand]; 3-cincta [Thomson cabinet label].
Subsequent authors (for example, Dalla Torre, 1901: 420; Perkins, 1941: 646; Oehlke, 1967: 27; Aubert, 1968: 194; 1969: 78) have chosen to alter the spelling of the name to *tricincta* and there is evidence (Thomson's own reference (1890: 1408) and cabinet label) that this is what was intended. However, a strict interpretation of Article 32(a)(ii) of the *Code* (as amended, *Bull. zool. Nom.* **31** (1974): 83) suggests that the original spelling should be retained. *Pimpla tricincta* Thomson would, in any case, be a junior primary homonym of *Pimpla tricincta* Cresson.
Identity. Junior synonym of *Itoplectis alternans* (Gravenhorst) (Perkins, 1941: 646).

Platylabus concinnus, 1888*b*: 1235. Syntype 1 ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund).
Label. Pålsjö [hand].
Identity. Platylabus concinnus Thomson.

Platylabus (Platylabus) cyaneoviridis, 1894: 2105. Syntypes 2 ♂, SWEDEN: Uppland, Upsala [= Uppsala] (UZI, Lund).
Labels. Upsal 30/VI 91. [hand]; cyaneoviridis m [Thomson cabinet label] (1 ♂). Upsal [hand] (1 ♂).
Identity. Cratichneumon cyaneoviridis (Thomson).

Platylabus (Tricholabus) femoralis, 1894: 2114. Syntype 1 ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund).
Labels. Hbg. [hand]; femoralis m [Thomson cabinet label].
Identity. Tricholabus femoralis (Thomson).

Platylabus (Platylabus) latiscapus, 1894: 2110. LECTOTYPE ♀, SWEDEN: Stockholm (UZI, Lund), here designated (selected by H. K. Townes).
Labels. 209 [hand]; Col. Hgn. [printed]; latiscapus [Thomson cabinet label].
Identity. Asthenolabus latiscapus (Thomson).

Platylabus (Platylabus) lativentris, 1894: 2109. Type(s) ♀, SWEDEN: Skåne, Ringsjön (lost).
Identity. Junior synonym of *Platylabus transversus* Bridgman (Perkins, 1953: 115).

Platylabus (Platylabus) muticus, 1894: 2112. Syntypes 1 ♀, 1 ♂, SWEDEN: Småland and Vermland [= Värmland] (UZI, Lund).
Labels. Sm. [printed]; Bhn [printed]; Col. Hgn. [printed]; muticus m [Thomson cabinet label] (♀). Verml [printed]; Col. Hgn. [printed] (♂).
Identity. Platylabus muticus Thomson.

Plectiscus (Plectiscus) bistriatus, 1888*b*: 1299. Syntype 1 ♂, SWEDEN: Skåne, Örtofta (UZI, Lund).
Label. Ört. [hand].
Identity. Plectiscidea bistriatus (Thomson).

Plectiscus (Dialipsis) crassipes, 1888*b*: 1304. Syntypes 7 ♀, 1 ♂, SWEDEN: [various localities] (UZI, Lund).
No notes were made of individual specimen labels.
Identity. Junior synonym of *Dialipsis exilis* Foerster (Townes, 1971: 196).

Plectiscus (Plectiscus) curticauda, 1888*b*: 1302. LECTOTYPE ♀, GERMANY (WEST): ? Kaltenkirchen (UZI, Lund), here designated (selected by J. F. Aubert).
Labels. Kalkh. 23/8.86. [hand]; curticauda [Thomson cabinet label].
Identity. Plectiscidea curticauda (Thomson) **comb. n.**

Plectiscus (Plectiscus) eurystigma, 1888*b*: 1301. Lectotype ♀, SWEDEN: Skåne, Esperöd [= Äsperöd] (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 396.
Labels. Esp [printed]; eurystigma [Thomson cabinet label].
Identity. Plectiscidea eurystigma (Thomson).

Plectiscus (Proclitus) heterocerus, 1888*b*: 1307. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 396.
Labels. Pål [hand]; heterocerus [Thomson cabinet label].
Identity. Proclitus heterocerus (Thomson).

Plectiscus (Proclitus) longitarsis, 1888*b*: 1306. Holotype ♀, GERMANY (EAST): Rostock (UZI, Lund).
Labels. Rostock 5.10.87 [hand]; longitarsis [Thomson cabinet label].
Identity. Proclitus longitarsis (Thomson).

Plectiscus (Aperileptus) obliquus, 1888*b*: 1298. LECTOTYPE ♀, SWEDEN: Skåne, Västra Vram (UZI, Lund), here designated (selected by R. Hinz).
Label. W.W. [hand].
Identity. Aperileptus obliquus (Thomson).

Plectiscus (Plectiscus) subteres, 1888*b*: 1300. Holotype ♀, GERMANY (UZI, Lund).
Labels. f. 22/5. 86. [hand]; subteres [Thomson cabinet label].
Identity. Plectiscidea subteres (Thomson).

Plectocryptus pectoralis, 1896: 2383. Syntypes 1 ♀, 2 ♂, SWEDEN: Skåne, Ringsjön (UZI, Lund).
Labels. [green square]; pectoralis m [Thomson cabinet label] (1 ♂). [green square] (1 ♀ 1 ♂).
Identity. Aconias pectoralis (Thomson) **comb. n.**

Plectocryptus scansor, 1890: 1532. Holotype ♀, SWEDEN: Göteborg (UZI, Lund).
Labels. Gbg [hand]; Scansor m [Thomson cabinet label].
Identity. Giraudia scansor (Thomson) **comb. n.**

Polyblastus (Nemioblastus) albicoxa, 1883: 901. Holotype ♀, SWEDEN: Skåne, Arrie (UZI, Lund).
Label. Ar [hand].

The specimen designated as lectotype by Kasparyan (1973: 233) is from Ringsjön (label, a green square) and cannot, therefore, be a syntype.
Identity. Polyblastus albicoxa Thomson.

Polyblastus (Scopiorus) angulatus, 1883: 902. Lectotype ♀, SWEDEN: Skåne, Ringsiön [= Ringsjön] (UZI, Lund), by designation of Kasparyan, 1973: 249.
Label. [small green square].
Identity. Ctenochira angulata (Thomson).

Polyblastus (Scopiorus) fusicornis, 1883: 903. Lectotype ♀, SWEDEN: Skåne, Pålsiö [= Pålsjö] (UZI, Lund), by designation of Kasparyan, 1973: 284.
Labels. Hbg [hand]; fusicornis [Thomson cabinet label].
Identity. Junior synonym of *Ctenochira validicornis* (Brischke) (Kasparyan, 1973: 284).

Polyblastus (Ctenacmus) genalis, 1883: 902. Type(s) ♀, SWEDEN: Skåne, Torekov (lost).
The specimen designated as lectotype by Kasparyan (1973: 259) is from Ringsjön (label, a green square) and cannot, therefore, be a syntype.
Identity. Ctenochira genalis (Thomson) (Kasparyan, 1973: 259, on the basis of the invalid 'lectotype').

Polyblastus macrocentrus, 1888*b*: 1257. Lectotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Aubert, 1966: 127.
Labels. Ört. [hand]; ♀ [printed].
Identity. Polyblastus macrocentrus Thomson.

Polyblastus (Ctenacmus) nigripalpis, 1883: 902. Lectotype ♂, SWEDEN: Skåne, Pålsiö [= Pålsjö] (UZI, Lund), by designation of Kasparyan, 1973: 262.
Labels. Hbg [hand]; vertic ∧ [hand]; nigripalpis [Thomson cabinet label].
Identity. Junior synonym of *Ctenochira haemosternus* (Haliday) (Kasparyan, 1973: 262).

Polyblastus pallicoxa, 1888*b*: 1257. Syntypes 5 ♀, 1 ♂, SWEDEN: Skåne, Pålsjö (UZI, Lund).
Labels. Pål [hand]; pallicoxa [Thomson cabinet label] (1 ♀). Pål. [hand] (4 ♀ 1 ♂).
Identity. Polyblastus pallicoxa Thomson.

Polyblastus (Ctenacmus) scutellaris, 1883: 901. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Kasparyan, 1973: 253.
Labels. Lund [printed]; scutellatus [Thomson cabinet label].
Identity. Junior primary homonym of *Polyblastus scutellaris* Holmgren. Replacement name *Polyblastus scutellatus* Thomson, 1888*b*: 1257. Junior synonym of *Ctenochira bisinuata* Foerster (Kasparyan, 1973: 253).

Polyblastus scutellatus, 1888*b*: 1257. Replacement name for *Polyblastus scutellaris* Thomson (see entry above).

Polyblastus (Polyblastus) subtilis, 1883: 900. Lectotype ♀, SWEDEN: Öland (UZI, Lund), by designation of Kasparyan, 1970: 863.
Labels. [large pink diamond]; subtilis [Thomson cabinet label].
Identity. Junior synonym of *Polyblastus varitarsus* (Gravenhorst) (Kasparyan, 1973: 227).

Polysphincta (Polysphincta) caudata, 1888*b*: 1253. Holotype ♀, SWEDEN: Skåne, Rönnemölla (UZI, Lund).
Labels. Rön. [hand]; caudata [Thomson cabinet label].
Identity. Junior synonym of *Sinarachna nigricornis* (Holmgren) (Oehlke, 1967: 25).

Polysphincta (Polysphincta) picticollis, 1888*b*: 1254. Lectotype ♂, SWEDEN: Gottland [= Gotland] (UZI, Lund), by designation of Aubert, 1966: 127.
Label. G. [hand].
Identity. Zatypota picticollis (Thomson).

Polysphincta pulchrator, 1877: 757. Lectotype ♀, SWEDEN: Skåne, Holmeja (UZI, Lund), by designation of Aubert, 1966: 127.
Labels. Hma [hand]; pulchrator [hand].
Identity. Junior synonym of *Zatypota percontatoria* (Müller) (Oehlke, 1967: 26).

Porizon (Barycnemis) anurus, 1889: 1365. Lectotype ♀, SWEDEN: Öland (UZI, Lund), by designation of Horstmann, 1981: 62.
Label. Ö. [printed].
Identity. Barycnemis anurus (Thomson).

Porizon (Cratophion) caudatulus, 1889: 1364. Holotype ♀, SWEDEN: Norrland (UZI, Lund).
Labels. Norl. [printed]; longicauda [Thomson cabinet label].
Identity. *Barycnemis caudatulus* (Thomson).

Porizon (Leptopygus) filicornis, 1889: 1366. Holotype ♀, GERMANY (WEST): Bavaria (UZI, Lund).
Labels. 73./311. ['73', hand; '311', printed]; Germ. [hand]; filicornis [Thomson cabinet label].
Identity. *Barycnemis filicornis* (Thomson).

Porizon (Barycnemis) gracillimus, 1889: 1365. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Aubert, 1966: 131.
Label. Lund [printed].
Identity. *Barycnemis gracillimus* (Thomson).

Porizon (Barycnemis) laeviceps, 1889: 1365. Lectotype ♀, SWEDEN: Skåne, Bögestad [= Bökestad] (UZI, Lund), by designation of Aubert, 1968: 196.
Label. Bs. [hand].
Identity. *Barycnemis laeviceps* (Thomson).

Pristomerus pallidus, 1890: 1456. Lectotype ♀, YUGOSLAVIA: Dalmatia (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 306.
Labels. Dalm [printed]; sulphureus [Thomson cabinet label].
Identity. *Pristomerus pallidus* Thomson.

Promethus albicoxa, 1890: 1476, 1479. Lectotype ♂, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 414.
Label. Pål. [hand].
Identity. Junior synonym of *Sussaba cognata* (Holmgren) (Townes, Momoi & Townes, 1965: 414).

Promethus laticarpus, 1890: 1476, 1481. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Diller, 1980: 60.
Label. Ld [hand].
There is a paralectotype male on the same pin as the lectotype.
Identity. Junior synonym of *Sussaba pulchella* (Holmgren) (Diller, 1980: 59).

Promethus melanaspis, 1890: 1477. Holotype ♀, GERMANY (WEST): Bavaria, near Munich (ZSBS, Munich).
Labels. 85. 818. [hand]; melanaspis [hand]; Th . . . [hand, partly illegible].
Identity. *Promethes melanaspis* (Thomson).

Promethus nigriventris, 1890: 1476. Lectotype ♀, SWEDEN: Halland, Östra Karup (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 413.
Labels. Krp 14/6 [hand]; nigriventris m [Thomson cabinet label].
Townes labelled the lectotype as '*Promethus albicoxa*' (for which species he also labelled a lectotype). This is undoubtedly a mistake and I have added my own label clarifying the status of the specimen as lectotype of *nigriventris*.
Identity. *Promethes nigriventris* (Thomson).

Pyracmon lateralis, 1887*c*: 1109. Lectotype ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), by designation of Horstmann, 1977: 73.
Labels. Rsjö 24/6 [printed]; lateralis [Thomson cabinet label].
Identity. Junior synonym of *Pyracmon truncicola* Thomson (Horstmann, 1977: 73).

Pyracmon truncicola, 1887*c*: 1109. Lectotype ♀, SWEDEN: Skåne, Ekeshult (UZI, Lund) by designation of Aubert, 1966: 130.
Labels. Ekh 16/6 [hand]; truncicola [Thomson cabinet label].
Identity. *Pyracmon truncicola* Thomson.

Rhaestus (Rhaestus) femoralis, 1894: 1976. Holotype ♀, FRANCE: Oignies (UZI, Lund).
Label. Oignies. [hand].
Identity. *Rhaestus femoralis* Thomson.

Rhaestus punctatus, 1890: 1533. Lectotype ♂, SWEDEN: Öland (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 243.
Label. Ö. [printed].
Identity. *Glyptorhaestus punctatus* (Thomson).

Rhaestus (Glyptorhaestus) wuestneii [as *wüstneii*], 1894: 1977. Lectotype ♀, DENMARK: Sønderborg (ZM, Copenhagen), by designation of Hinz, 1975: 44.

Labels. Sdb'g 23.V.83 [hand]; Coll. Wüstnei. [printed].

Identity. Junior synonym of *Glyptorhaestus punctulatus* (Woldstedt) (Hinz, 1975: 44).

Sagaritis brachycera, 1887*c*: 1091. LECTOTYPE ♀, SWEDEN: Öland, Borgholm (UZI, Lund), here designated (selected by R. Hinz).

*Label.*Ö. [printed].

Identity. Campoletis brachycera (Thomson).

Sagaritis erythropus, 1887*c*: 1093. Lectotype ♀, SWEDEN: Skåne, Ringsjön (UZI, Lund), by designation of Aubert, 1972: 148.

Labels. Rsiö [printed]; erythropus [Thomson cabinet label].

Identity. Campoletis erythropa (Thomson).

Sagaritis macroura, 1887*c*: 1093. Syntype 1 ♂, SWEDEN: Skåne, Örtofta (UZI, Lund).

Label. Örtofta [printed].

Identity. Campoletis macroura (Thomson).

Sagaritis mucronella, 1887*c*: 1095. Holotype ♀, SWEDEN: Skåne, Arrie (UZI, Lund).

Labels. Ar. [hand]; mucronella [Thomson cabinet label].

Identity. Campoletis mucronella (Thomson).

Sagaritis varians, 1887*c*: 1095. LECTOTYPE ♀, SWEDEN: Skåne, Lund (UZI, Lund), here designated (selected by R. Hinz).

Label. L-d [printed].

Identity. Campoletis varians (Thomson).

Saotus nigriventris, 1894: 2019. Holotype ♀, GERMANY (UZI, Lund).

Labels. Mdrk 20.VI.83 [hand]; nigriventris [Thomson cabinet label].

Identity. Saotis nigriventris (Thomson).

Saotus varicoxa, 1894: 2019. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Kerrich, 1942: 70.

Labels. Pål [hand]; varicoxa [Thomson cabinet label].

Identity. Saotis varicoxa (Thomson).

Smicroplectrus costulatus, 1883: 888. Holotype ♀, SWEDEN: Lappland (UZI, Lund).

Labels. Lpl. [printed]; costulatus [Thomson cabinet label].

Identity. Junior synonym of *Smicroplectrus jucundus* (Holmgren) (Kerrich, 1952: 409).

Spilocryptus dispar, 1873: 504. Syntypes 7 ♀, 14 ♂, SWEDEN: [various localities] (UZI, Lund).

All specimens standing under this name (except 1 ♂ with a white annulus on each antenna and differing in other ways from the description) are regarded as syntypes. Some were probably added to the collection after 1873 but there is no way of differentiating the original syntype series. The information given by Thomson subsequently (1896: 2367–2368) needs to be taken into consideration when a lectotype is selected.

Details of individual specimen labels were not noted.

Identity. Junior synonym of *Agrothereutes abbreviator* (Fabricius) (Roman, 1939: 187).

Spilocryptus nasutus, 1873: 505. Syntypes 4 ♀, 3 ♂, SWEDEN: Skåne, Gotland and Öland (UZI, Lund).

Labels. Rsiö [printed]; nasutus [Thomson cabinet label] (1 ♀). Gott. [hand] (1 ♀). Gott [hand]; Col Dbm [printed] (1 ♀). Pål. [hand] (1 ♀). Ö. [printed] (2 ♂). [small green square] (1 ♂).

Identity. Agrothereutes nasutus (Thomson) **comb. n.**

Spilocryptus ornatulus, 1873: 507. Lectotype ♀, SWEDEN: Skåne, Dalby (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 171.

Label. Dby 9/53 [hand].

Identity. Gambrus ornatulus (Thomson).

Spilocryptus tibialis, 1873: 503. Lectotype ♀, SWEDEN: Öland (UZI, Lund), by designation of Horstmann, 1968: 127.

Labels. Ö. [printed]; tibialis [Thomson cabinet label].

The lectotype designation published by Aubert (1966: 128) is invalid because the specimen concerned is not a syntype (see Horstmann, 1968: 127).

Identity. Agrothereutes tibialis (Thomson).

Spilocryptus zygaenarum, 1873: 504. Lectotype ♀, DENMARK: Zealand (ZM, Copenhagen), by designation of Horstmann, 1968: 124.

Labels. ♀ 7/1858 Af Zygona filipend. Drewsen [hand]; Danmark ex coll. Schiødte [printed].

The lectotype designation published by Aubert (1966: 128) is invalid because the specimen concerned is not a syntype (see Horstmann, 1968: 125).

Identity. Junior synonym of *Agrothereutes fumipennis* (Gravenhorst) (Horstmann, 1968: 124).

Spudaeus facialis, 1894: 2014. Lectotype ♀, SWEDEN: Lappland (UZI, Lund), by designation of Aubert, 1966: 127.

Labels. [yellow square]; Col Ros [printed]; facialis [Thomson cabinet label].

Identity. Synodites facialis (Thomson) **comb. n.**

Spudaeus mandibularis, 1894: 2013. Lectotype ♀, SWEDEN: Norrland (UZI, Lund), by designation of Aubert, 1976*b*: 273.

Labels. Norl. [printed]; ♀ [printed]; mandibularis [Thomson cabinet label].

Identity. Campodorus mandibularis (Thomson).

Spudaeus mesocastanus, 1894: 2011. Type(s) ♀, SWEDEN: Norrland (lost).

There is one female specimen in the collection originating from the Rudolphi collection, labelled 'Hlm' [= Holmia]. Most Rudolphi specimens come from Hälsingland (part of 'Norrland'). It is, therefore, possible that this specimen is the type and that Thomson misread 'Hlm' as 'Hls'.

Identity. Rhinotorus mesocastanus (Thomson) **comb. n.** (on the basis of the specimen in the collection).

Spudaeus nigridens, 1894: 2013. Lectotype ♀, FRANCE: Phalempin (UZI, Lund), by designation of Aubert, 1976*b*: 274.

Labels. Phalempin [hand]; Gall. [hand].

Identity. Campodorus nigridens (Thomson).

Spudaeus sanguinipes, 1894: 2012. Syntype 1 ♂, ? syntype 1 ♀, SWEDEN: Norrland (UZI, Lund).

Labels. Col. Rud. [hand] (♂). [square of paper]; Col. Hgn. [printed]; sanguinipes m [Thomson cabinet label] (♀).

There is no evidence that the female came from Norrland so it is only tentatively regarded as a syntype.

Identity. ? *Arbelus sanguinipes* (Thomson) **comb. n.**

Spudaeus stenocerus, 1894: 2013. Syntypes ♀ ♂, SWEDEN: Norrland and Skåne, Ringsjön (lost).

Identity. ? *Campodorus stenocerus* (Thomson) **comb. n.**

Spudaeus subimpressus, 1894: 2011. Syntype 1 ♀, SWEDEN: Skåne, Båstad (UZI, Lund).

Labels. Båst [hand]; ♀ [printed]; subimpressus [Thomson cabinet label].

Identity. Rhinotorus subimpressus (Thomson) **comb. n.**

Spudastica petiolaris, 1887*c*: 1123. LECTOTYPE ♀, SWEDEN: Skåne, Ringsiön [= Ringsjön] (UZI, Lund), here designated (selected by H. K. Townes).

Label. [small green square].

Identity. Junior synonym of *Spudastica kriechbaumeri* (Bridgman) (Townes, 1970*b*: 169).

Stenocryptus nigriventris, 1874: 604. Lectotype ♀, SWEDEN: Lappland (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 156.

Label. Lap [hand].

Identity. Cubocephalus nigriventris (Thomson).

Stilpnus angustatus, 1884: 1027. Holotype ♀, SWEDEN: Skåne, Rönnemölla (UZI, Lund).

Labels. Rön [hand]; alutaceus [hand]; angustatus [Thomson cabinet label].

Identity. Stilpnus angustatus Thomson.

Stilpnus crassicornis, 1884: 1027. Syntype 1 ♀, SWEDEN: Skåne, Båstad (UZI, Lund).

Labels. Scan [printed]; crassicornis [Thomson cabinet label].

Identity. Stilpnus crassicornis Thomson.

Stilpnus tenuipes, 1884: 1028. Syntype 1 ♂, SWEDEN: Skåne, Pålsjö (UZI, Lund).

Label. Pålsiö [printed].

Identity. Stilpnus tenuipes Thomson.

Stylocryptus (Stylocryptus) analis, 1883: 871. Lectotype ♀, SWEDEN: Skåne, Fogelsång [= Fågelsång] (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 139.

Label. Fg. [hand].

Stylocryptus (Gnathocryptus) clypealis, 1883: 870. Lectotype ♂, SWEDEN: Skåne, Ortofta (UZI, Lund), by designation of Aubert, 1966: 129.
Label. Ört [hand].
Identity. Glyphicnemis clypealis (Thomson).

Stylocryptus eurycerus, 1896: 2386. Holotype ♀, SWEDEN: Stockholm (UZI, Lund).
Labels. Hlm [printed]; De V [printed]; Col. Hgn. [printed]; eurycerus m [Thomson cabinet label].
Identity. Endasys eurycerus (Thomson) (teste J. Sawoniewicz).

Stylocryptus (Stylocryptus) minutulus, 1883: 872. Syntypes 2 ♀, 6 ♂, SWEDEN: Skåne, Ringsiön [= Ringsjön] and Båstad (UZI, Lund).
Labels. [small green square] (1 ♀ 4 ♂). Rsiö [printed] (2 ♂, on one pin). Båst [hand] (1 ♀).
Identity. Endasys minutulus (Thomson).

Symplecis facialis, 1888*b*: 1286. LECTOTYPE ♀, SWEDEN: Skåne, Degeberga (UZI, Lund), here designated (selected by G. van Rossem).
Labels. Dgb. [hand]; facialis [Thomson cabinet label].
Identity. Symplecis facialis Thomson.

Syndipnus (Polyrhysius) anterior, 1894: 1999. LECTOTYPE ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), here designated (selected by R. Hinz).
Labels. Pål [hand]; ♀ [printed]; anterior m [Thomson cabinet label].
Identity. Synocoetes anterior (Thomson) **comb. n.**

Syndipnus (Trophoctonus) curvulus, 1894: 2000. Syntypes 1 ♀, 1 ♂, SWEDEN: Norrland (UZI, Lund).
Labels. Rud. [hand]; curvulus [Thomson cabinet label].
The two syntypes are on one pin.
Identity. Synomelix curvulus (Thomson).

Syndipnus (Hypamblys) lineiger, 1894: 2007. Syntype 1 ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund).
Labels. Pål. [hand]; lineiger n. [Thomson cabinet label].
The syntype lacks the gaster.
Identity. Synodites lineiger (Thomson) **comb. n.**

Syndipnus (Synodytes) orbitalis, 1894: 2002. Holotype ♀, SWEDEN: Öland (UZI, Lund).
Labels. Ö. [printed]; brevicalcar [Thomson cabinet label].
Identity. Synodites orbitalis (Thomson).

Syndipnus (Smicrolius) parvicalcar, 1894: 2008. LECTOTYPE ♀, DENMARK: Sønderborg (UZI, Lund), here designated (selected by H. K. Townes).
Label. Sondb'g [hand].
Identity. Smicrolius parvicalcar (Thomson).

Syndipnus (Synodytes) parviceps, 1894: 2002. Holotype ♂, SWEDEN: Lappland (UZI, Lund).
Labels. Lpl. [printed]; parviceps [Thomson cabinet label].
Identity. Synodites parviceps (Thomson).

Syndipnus (Syndipnus) pectoralis, 1894: 2006. Syntypes 3 ♀, FRANCE: Libercourt and Thumeries (UZI, Lund).
Labels. Libercourt. [hand]; flavipectus [Thomson cabinet label] (1 ♀). Thumeries. [hand] (1 ♀). Libercourt. [hand]; Gall. [hand] (1 ♀).
Identity. Syndipnus pectoralis Thomson.

Syndipnus (Syndipnus) punctiscuta, 1894: 2005. Syntypes 8 ♀, 1 ♂, SWEDEN: Skåne, Ilstorp; FRANCE: Fortif; GERMANY (WEST): Gotteskoog See and Glücksburg; and DENMARK: Sandacker (UZI, Lund).
Labels. Ilsp 15/7 [hand] (1 ♂). Fortif. [hand]; punctiscuta m [Thomson cabinet label] (1 ♀). Fortif. [hand] (4 ♀). Gotteskog See. 7.8.87 [hand] (1 ♀). Glücksb'g 8.8.92. [hand] (1 ♀). Sandack. 27.7.88 [hand] (1 ♀).
Identity. Syndipnus punctiscuta Thomson.

Syndipnus (Synodytes) subscaber, 1894: 2002. Syntype 1 ♀, SWEDEN: Norrland (UZI, Lund).
Labels. Norl. [printed]; subscaber [Thomson cabinet label].
Aubert (1972: 147) was incorrect in regarding this specimen as holotype. Thomson mentions material from Norrland and a specimen from Germany sent by Kriechbaumer. The latter specimen is not in Lund but may be in the Kriechbaumer collection in Munich.
Identity. Synodites subscaber (Thomson).

Synetaeris carbonella, 1887*c*: 1115. Syntype 1 ♀, SWEDEN: Skåne, Yddinge (UZI, Lund).
Labels. Bkbg [hand]; carbonella [Thomson cabinet label].
Identity. Synetaeris carbonella Thomson. Horstmann (1977) has synonymised *Synetaeris* with *Pyracmon.*

Synetaeris heteropus, 1887*c*: 1115. Lectotype ♀, GERMANY (UZI, Lund), by designation of Horstmann, 1977: 73.
Labels. Germ [hand]; heteropus [Thomson cabinet label].
The lectotype was selected and labelled by Townes and not Aubert as stated by Horstmann (1977: 73).
Identity. Synetaeris heteropus Thomson. Horstmann (1977) has synonymised *Synetaeris* with *Pyracmon.*

Thersilochus (Thersilochus) apertus, 1889: 1382. Lectotype ♀, SWEDEN: Östergötland, Skeninge [= Skänninge] (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 314.
Labels. 104. [hand]; ÖG [hand] [not '50' as stated by Horstmann (1971b: 99) !]; apertus [Thomson cabinet label].
Identity. Nanodiaparsis apertus (Thomson).

Thersilochus (Thersilochus) brevicauda, 1889: 1382. Lectotype ♀, SWEDEN: Skåne, Helsingborg (UZI, Lund), by designation of Horstmann, 1967*b*: 129.
Labels. Hbg [hand]; brevicauda [Thomson cabinet label].
The lectotype is the uppermost of three specimens on one pin. There is a fourth card point (without a specimen) above the lectotype.
Identity. Aneuclis brevicauda (Thomson).

Thersilochus (Thersilochus) carinifer, 1889: 1392. Lectotype ♀, FRANCE (UZI, Lund), by designation of Horstmann, 1967*b*: 127.
Labels. Gall. [hand]; carinifer [Thomson cabinet label].
Identity. Diaparsis carinifer (Thomson).

Thersilochus (Thersilochus) crassicauda, 1889: 1396. Lectotype ♀, GERMANY (UZI, Lund), by designation of Horstmann, 1971*b*: 58.
Labels. 381 [hand]; [small yellowish triangle]; Germ. [hand]; crassicauda [Thomson cabinet label].
Identity. Junior synonym of *Pectinolochus ensifer* (Brischke) (Horstmann, 1971*b*: 58).

Thersilochus (Thersilochus) crassipes, 1889: 1400. Lectotype ♀, FRANCE: Lille, Raismes (UZI, Lund), by designation of Horstmann, 1967*b*: 127.
Labels. Raismes. [hand]; Gall [hand].
Identity. Rugodiaparsis crassipes (Thomson).

Thersilochus (Thersilochus) decrescens, 1889: 1386. Lectotype ♀, GERMANY (UZI, Lund), by designation of Horstmann, 1971*b*: 77.
Labels. [grey triangle]; Germ. [hand]; decrescens [Thomson cabinet label].
Identity. Phradis decrescens (Thomson).

Thersilochus (Diaparsus) fenestralis, 1889: 1370. Lectotype ♀, GERMANY (EAST): Rostock (UZI, Lund), by designation of Horstmann, 1971*b*: 112.
Labels. Rostock 27.4.85 [hand]; Germ. [hand]; fenestralis [Thomson cabinet label].
Identity. Gonolochus fenestralis (Thomson).

Thersilochus (Thersilochus) filicornis, 1889: 1393. Lectotype ♀, SWEDEN: Skåne, Alnarp (UZI, Lund), by designation of Horstmann, 1971*b*: 121.
Labels. Alnarp [printed]; filicornis [Thomson cabinet label].
There is a paralectotype ♂ on the same pin as (and above) the lectotype.
Identity. Tersilochus filicornis (Thomson).

Thersilochus (Thersilochus) flavicornis, 1889: 1391. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Horstmann, 1971*b*: 106.
Labels. Ld [hand]; ruficornis [Thomson cabinet label].
Identity. Junior synonym of *Diaparsis stramineipes* (Brischke) (Horstmann, 1971*b*: 106).

Thersilochus (Diaparsus) genalis, 1889: 1373. Lectotype ♂, SWEDEN: Skåne, Yddinge (UZI, Lund), by designation of Aubert, 1966: 131.
Label. Bök 8/78 [hand].
I do not agree with Horstmann (1971*b*: 105) that the earlier publication by Aubert (1964: 63) constitutes a valid lectotype designation.
Identity. Junior synonym of *Diaparsis nutritor* (Fabricius) (Horstmann, 1971*b*: 104–105).

Thersilochus (Thersilochus) heterocerus, 1889: 1383. Lectotype ♀, SWEDEN: Skåne (UZI, Lund), by designation of Horstmann, 1967*b*: 127.

Labels. Scan [printed]; *heterocerus* [Thomson cabinet label].

The lectotype is the lower of two females on one pin. There is a third card point (without a specimen) below the lectotype.

Identity. Tersilochus heterocerus (Thomson).

Thersilochus (Thersilochus) incidens, 1889: 1382. Lectotype ♀, SWEDEN: Skåne, Trelleborg (UZI, Lund), by designation of Horstmann, 1971*b*: 61.

Label. Tbg 6/84 [hand].

Identity. Aneuclis incidens (Thomson).

Thersilochus (Thersilochus) interstitialis, 1889: 1389. Lectotype ♂, SWEDEN: Skåne, Lomma (UZI, Lund), by designation of Horstmann, 1967*b*: 128.

Labels. L-a [printed]; incidens [Thomson cabinet label].

The lectotype is the lowest of three specimens on one pin. The middle specimen is represented only by part of a wing.

Identity. Phradis interstitialis (Thomson).

Thersilochus (Thersilochus) liopleuris, 1889: 1398. Lectotype ♀, SWEDEN: Norrland (UZI, Lund), by designation of Horstmann, 1971*b*: 129.

Labels. Norl [printed]; liopleuris [Thomson cabinet label].

Identity. Tersilochus liopleuris (Thomson).

Thersilochus (Thersilochus) longicornis, 1889: 1384. Type(s) ♀, SWEDEN: Skåne, Trelleborg (lost).

The specimen designated as lectotype by Horstmann (1971*b*: 129) is from Tvedöra [as stated by Horstmann !] and cannot, therefore, be from the type-series.

Identity. Tersilochus longicornis (Thomson) (Horstmann, 1971*b*: 129, on the basis of the invalid 'lectotype').

Thersilochus (Thersilochus) maritimus, 1889: 1381. Holotype ♀, SWEDEN: Skåne, Kempinge [= Kämpinge] (UZI, Lund).

Labels. Kpe 8/74 [hand]; maritimus [Thomson cabinet label].

Identity. Aneuclis maritimus (Thomson).

Thersilochus (Thersilochus) melanogaster, 1889: 1392. Lectotype ♀, SWEDEN: Skåne, Tvedöra (UZI, Lund), by designation of Aubert in Aubert & Jourdheuil, 1959: 187.

Label. Tve 5/80 [hand].

Identity. Tersilochus melanogaster (Thomson).

Thersilochus (Thersilochus) monticola, 1889: 1388. Lectotype ♂, FRANCE: Mt des Cattes (UZI, Lund), by designation of Horstmann, 1971*b*: 65.

Labels. Mt. des Cattes. [hand]; Gall [hand]; montanus [Thomson cabinet label].

Identity. Junior synonym of *Heterocola proboscidalis* (Thomson) (Horstmann, 1971*b*: 65).

Thersilochus (Thersilochus) obliquus, 1889: 1392. Lectotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Horstmann, 1971*b*: 131.

Label. Ört. [hand].

Identity. Tersilochus obliquus (Thomson).

Thersilochus (Thersilochus) pallicarpus, 1889: 1387. Lectotype ♀, SWEDEN: Stockholm (UZI, Lund), by designation of Horstmann, 1967*b*: 129.

Labels. Hlm [printed]; Stål [printed]; pallicarpus [Thomson cabinet label].

Identity. Junior synonym of *Heterocola proboscidalis* (Thomson) (Horstmann, 1971*b*: 65).

Thersilochus (Diaparsus) parviceps, 1889: 1376. Holotype ♀, FRANCE (UZI, Lund).

Labels. Gall. [hand]; parviceps [Thomson cabinet label].

Identity. Junior synonym of *Microdiaparsis versutus* (Holmgren) (Horstmann, 1971*b*: 81).

Thersilochus (Thersilochus) proboscidalis, 1889: 1388. Lectotype ♀, GERMANY (WEST): Bavaria (UZI, Lund), by designation of Horstmann, 1971*b*: 65.

Label. Germ. [hand].

Identity. Heterocola proboscidalis (Thomson).

Thersilochus (Thersilochus) striola, 1889: 1396. Lectotype ♀, NORWAY (UZI, Lund), by designation of Horstmann, 1971*b*: 56.
Labels. 287 [hand]; Norv. [hand]; Striola [Thomson cabinet label].
Identity. Pectinolochus striolus (Thomson).

Thersilochus (Thersilochus) subdepressus, 1889: 1396. Lectotype ♀, SWEDEN: Skåne, Ringsiön [= Ringsjön] (UZI, Lund), by designation of Horstmann, 1971*b*: 132.
Labels. [small green square]; subdepressus [Thomson cabinet label].
Identity. Tersilochus subdepressus (Thomson).

Thersilochus (Thersilochus) temporalis, 1889: 1387. Lectotype ♀, GERMANY (UZI, Lund), by designation of Horstmann, 1971*b*: 73.
Labels. [grey triangle]; Germ [hand].
Identity. Junior synonym of *Phradis brevis* (Brischke) (Horstmann, 1971*b*: 73).

Thymarus collaris, 1883: 909. Syntype 1 ♂, SWEDEN: Gottland [= Gotland] (UZI, Lund).
Label. Gott [printed].
Identity. Thymaris collaris (Thomson).

Thymarus compressus, 1883: 909. LECTOTYPE ♀, SWEDEN: Skåne, Ringsiön [Ringsjön] (UZI, Lund), here designated (selected by H. K. Townes).
Labels. Rsiö [printed]; compressus [Thomson cabinet label].
Identity. Thymaris compressa (Thomson).

Trachyarus corvinus, 1891: 1612. LECTOTYPE ♀, SWEDEN: Skäne, Pålsjö (UZI, Lund), here designated (selected by H. K. Townes).
Labels. Pål [hand]; corvinus m [Thomson cabinet label].
Identity. Trachyarus corvinus Thomson.

Tranosema arenicola, 1887*c*: 1138. Lectotype ♀, SWEDEN: Skåne, Kungsmarken (UZI, Lund), by designation of Horstmann, 1977: 78.
Labels. Kgsm 30/7 [hand]; arenicola [Thomson cabinet label].
Identity. Junior synonym of *Tranosema rostralis* (Brischke) (Horstmann, 1977: 78).

Tranosema latiuscula, 1887*c*: 1138. Type(s) ♀, SWEDEN: Skåne, Lund (lost).
A lectotype designation has been published by Hortsmann (1977: 78) for this species. I regard it as invalid because I consider the specimen not to be a syntype. It disagrees with the original description in a number of important characters. Of the five specimens standing under this name one female from Skabersjö [not a type and labelled 'Skb' and 'latiuscula'] agrees very well with the description and is the basis of the generic placement given here.
Identity. Dolophron latiusculus (Thomson) **comb. n.**

Trematopygus curvispina, 1883: 930. Holotype ♀, SWEDEN: Skåne, Stehag (UZI, Lund).
Labels. Rsiö [printed]; ♀ [printed]; curvispina [Thomson cabinet label].
Identity. Lethades curvispina (Thomson) **comb. n.**

Trematopygus kriechbaumeri, 1894: 2015. Syntypes 1 ♀ (UZI, Lund), 1 ♀ (ZSBS, Munich), GERMANY (WEST): Bavaria.
Labels. Alpes [printed]; 2307. [hand]; Kriechbaumeri m [Thomson cabinet label] (Lund specimen). Mon. 9.5.56. A.Krchb [hand]; 8800. [hand] (Munich specimen).
Identity. Junior synonym of *Trematopygus melanocerus* (Gravenhorst) (Townes, 1970*b*: 71).

Trematopygus lethierryi, 1894: 2016. Lectotype ♀, FRANCE: Lille, Libercourt (UZI, Lund), by designation of Aubert, 1966: 127.
Labels. Libercourt. [hand]; Lethierryi [Thomson cabinet label].
Identity. Trematopygus lethierryi Thomson.

Trematopygus scabriculus, 1883: 930. Lectotype ♀, SWEDEN: Jämtland, Åreskutan (UZI, Lund), by designation of Aubert, 1972: 147.
Label. Åre [hand].
Identity. Lethades scabriculus (Thomson).

Trichocryptus aquaticus, 1874: 611. Syntypes 9 ♀, 4 ♂, SWEDEN: Skåne, [various localities] (UZI, Lund).
Details of individual labels were not noted.
It is unlikely that all the specimens under this name date from 1874. However, as there is no means of differentiating the original series all are regarded as syntypes.
Identity. Apsilops aquaticus (Thomson) **comb. n.**

Triclistus albicinctus, 1887*b*: 206. Type(s) ♀, SWEDEN (lost).
Neotype ♀, GERMANY (UZI, Lund), by designation of Aeschlimann, 1973*b*: 249.
Identity. Triclistis albicinctus Thomson.

Triclistus areolatus, 1887*b*: 203. Lectotype ♀, SWEDEN: Skåne (UZI, Lund), by designation of Aubert, 1966: 128.
Label. Scan camp [printed].
Identity. Triclistus areolatus Thomson.

Triclistus facialis, 1887*b*: 205. Holotype ♀, SWEDEN: Gotland (UZI, Lund).
Labels. Gott [printed]; facialis [Thomson cabinet label].
Identity. Triclistus facialis Thomson.

Triclistus lativentris, 1887*b*: 203. Lectotype ♀, SWEDEN: Skåne, Örtofta (UZI, Lund), by designation of Aubert, 1966: 128.
Labels. Ört. [hand]; lativentris [Thomson cabinet label].
Identity. Triclistus lativentris Thomson.

Triclistus longicalcar, 1887*b*: 205. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Aubert, 1966: 128.
Label. L-d [printed].
Identity. Triclistus longicalcar Thomson.

Triclistus nitifrons, 1887*b*: 204. Lectotype ♀ FRANCE: Phalempin (UZI, Lund), by designation of Aeschlimann, 1973*b*: 238.
Labels. Phalempin [hand]; Gall. [hand]; nitifrons [Thomson cabinet label].
Identity. Junior synonym of *Triclistus pallipes* Holmgren (Aeschlimann, 1973*b*: 236).

Triclistus pubiventris, 1887*b*: 205. Lectotype ♀, SWEDEN: Skåne, Pålsjö (UZI, Lund), by designation of Aeschlimann, 1973*b*: 249.
Labels. Pål [hand]; pubiventris [Thomson cabinet label].
Aubert's lectotype designation (1966: 128) is not considered valid because he did not indicate (in either the publication or by labelling) which of two specimens in one pin was selected. The lectotype is the upper specimen.
Identity. Triclistus pubiventris Thomson.

Triclistus spiracularis, 1887*b*: 205. Lectotype ♀, SWEDEN: Norrland (UZI, Lund), by designation of Aubert, 1966: 128.
Label. Norl. [printed].
Identity. Triclistus spiracularis Thomson.

Tryphon auricularis, 1883: 897. Lectotype ♂, SWEDEN: Skåne, Fågelsång (UZI, Lund), by designation of Townes, Momoi & Townes, 1965: 106.
Label. Fsg 1/7 [hand].
Identity. Tryphon auricularis Thomson.

Tryphon bidentulus, 1883: 897. Lectotype ♂, SWEDEN: Skåne, Ringsiön [= Ringsjön] (UZI, Lund), by designation of Kasparyan, 1969: 655.
Label. [small green square].
Identity. Tryphon bidentulus Thomson.

Tryphon ceratophorus, 1888*b*: 1256. Lectotype ♀, SWEDEN: Skåne, Lund (UZI, Lund), by designation of Kasparyan, 1971: 293.
Label. Lund [printed].
Identity. Cosmoconus ceratophorus (Thomson).

Tryphon erythrogaster, 1883: 897. Lectotype ♀, SWEDEN: Skåne, Skabersjö (UZI, Lund), by designation of Kasparyan, 1969: 658.
Label. Skb [hand].
The lectotype is the lower of two specimens on the same pin.
Identity. Junior synonym of *Tryphon relator* (Thunberg) (Kasparyan, 1969: 658).

Tryphon pleuralis, 1883: 897. Syntype 1 ♂, SWEDEN: Skåne, Ringsjön (UZI, Lund).
Label. [small green square].
Identity. Junior primary homonym of *Tryphon pleuralis* Cresson. Replacement name *Tryphon abditus* Kasparyan, 1969: 654.

Xylonomus glyptus, 1877: 776. Syntype 1 ♂, SWEDEN: Öland (UZI, Lund).
Labels. Ö. [printed]. [paper square].
Identity. Xorides glyptus (Thomson).

Nomenclatural summary

A systematic list of the species treated in this paper is given below. The classification is basically that of Townes (as outlined in the introduction) but the family-group names (subfamilies, tribes and subtribes) are those correct under the *Code* (see Fitton & Gauld, 1976; 1978).

Subfamily **PIMPLINAE**

Tribe **EPHIALTINI**

EXERISTES Foerster
roborator (Fabricius)
brachycera (Thomson)
punctata (Thomson)

SCAMBUS Hartig
brevicornis (Gravenhorst)
nigriscaposa (Thomson)
punctiventris (Thomson)
nigricans (Thomson)

LIOTRYPHON Ashmead
crassisetus (Thomson)
pleuralis (Thomson)

TOWNESIA Ozols
tenuiventris (Holmgren)
antefurcalis (Thomson)

PARAPERITHOUS Haupt
gnathaulax (Thomson)
luteipes (Thomson)

DOLICHOMITUS Smith
cognator (Thunberg)
macrurus (Thomson)
dux (Tschek)
crassiceps (Thomson)
messor (Gravenhorst)
heteropus (Thomson)
populneus (Ratzeburg)
abbreviatus (Thomson)
scutellaris (Thomson)
terebrans (Ratzeburg)
planifrons (Thomson)
tuberculatus (Geoffroy)
parallelus (Thomson)

ACROPIMPLA Townes
pictipes (Gravenhorst)
stenostigma (Thomson)

TROMATOBIA Foerster
ovivora (Boheman)
parallela (Thomson)

Tribe **POLYSPHINCTINI**

DREISBACHIA Townes
pictifrons (Thomson)

SINARACHNA Townes
nigricornis (Holmgren)
caudata (Thomson)

ZATYPOTA Foerster
percontatoria (Müller)
pulchrator (Thomson)
picticollis (Thomson)

Tribe **PIMPLINI**

ITOPLECTIS Foerster
alternans (Gravenhorst)
tricineta (Thomson)
tricincta (Thomson) (unjustified emendation)
clavicornis (Thomson)
viduata (Gravenhorst)
ovalis (Thomson)

APECHTHIS Foerster
quadridentata (Thomson)

PIMPLA Fabricius
flavicoxis Thomson
sodalis Ruthe
longiceps Thomson
spuria Gravenhorst
strigipleuris Thomson

Tribe **DELOMERISTINI**

DELOMERISTA Foerster
laevifrous (Thomson)
laevifrons (Schmiedeknecht) (unjustified emendation)

Subfamily **TRYPHONINAE**

Tribe **PHYTODIETINI**

PHYTODIETUS Gravenhorst
crassitarsis Thomson
geniculatus Thomson
obscurus Desvignes
continuus Thomson
ornatus Desvignes
rubricosus Thomson

NETELIA Gray
cristatus (Thomson)
dilatatus (Thomson)
brachycerus (Thomson)
fuscicornis (Holmgren)
gracilipes (Thomson)
latungulus (Thomson)
melanurus (Thomson)
nigricarpus (Thomson)
ocellaris (Thomson)
opaculus (Thomson)

Tribe **THYMARIDINI**

THYMARIS Foerster
- ***collaris*** (Thomson)
- ***compressa*** (Thomson)

OEDEMOPSIS Tschek
- ***limbata*** Thomson

Tribe **TRYPHONINI**

GRYPOCENTRUS Ruthe
- ***apicalis*** Thomson

POLYBLASTUS Hartig
- ***albicoxa*** Thomson
- ***macrocentrus*** (Thomson)
- ***pallicoxa*** Thomson
- ***varitarsus*** (Gravenhorst)
    - *subtilis* Thomson

CTENOCHIRA Foerster
- ***angulata*** (Thomson)
- ***bisinuata*** Foerster
    - *scutellaris* (Thomson) (homonym)
    - *scutellatus* (Thomson)
- ***genalis*** (Thomson)
- ***haemosternus*** (Haliday)
    - *nigripalpis* (Thomson)
- ***validicornis*** (Brischke)
    - *fusicornis* (Thomson)

ERROMENUS Holmgren
- ***junior*** (Thunberg)
    - *arenicola* Thomson
- ***melanotus*** (Gravenhorst)
    - *cavigena* Thomson
- ***plebejus*** (Woldstedt)
    - *brevitarsis* Thomson
- ***punctatus*** (Woldstedt)
    - *simplex* Thomson

COSMOCONUS Foerster
- ***ceratophorus*** (Thomson)

TRYPHON Fallén
- ***abditus*** Kasparyan
    - *pleuralis* Thomson (homonym)
- ***auricularis*** Thomson
- ***bidentulus*** Thomson
- ***relator*** (Thunberg)
    - *erythrogaster* Thomson

Tribe **EXENTERINI**

KRISTOTOMUS Mason
- ***laetus*** (Gravenhorst)
    - *calcaratus* (Thomson)
    - *marginatus* (Thomson)

CYCASIS Townes
- ***rubiginosus*** (Gravenhorst)
    - *binotatus* (Thomson)
    - *parvulus* (Thomson)

EXYSTON Schiødte
- ***calcaratus*** Thomson
- ***genalis*** Thomson
- ***pratorum*** (Woldstedt)
    - *brevipetiolatus* Thomson
- ***sponsorius*** (Fabricius)
    - *carinatus* Thomson

SMICROPLECTRUS Thomson
- ***jucundus*** (Holmgren)
    - *costulatus* Thomson

ACROTOMUS Holmgren
- ***lucidulus*** (Gravenhorst)
    - *auriculatus* (Thomson)

CTENISCUS Haliday
- ***frontalis*** (Thomson) **comb. n.**
- ***nigrifrons*** (Thomson)
- ***pallitarsis*** (Thomson)
- ***pedatorius*** (Panzer)
    - *filipalpis* (Thomson)

EXENTERUS Hartig
- ***claripennis*** Thomson
- ***laricinus*** Thomson
    - ? *adspersus* Hartig
- ***oriolus*** Hartig
    - *flavellus* Thomson
- ***simplex*** Thomson

ERIDOLIUS Foerster
- ***albicoxa*** (Thomson)
- ***brevigena*** (Thomson)
- ***deletus*** (Thomson)
- ***genalis*** (Thomson) **comb. n.**
- ***lineiger*** (Thomson)
- ***marginatus*** (Thomson)
- ***punctipes*** (Thomson)
- ? ***punctipleuris*** (Thomson) **comb. n.**
- ***quadrinotatus*** (Thomson) **comb. n.**
- ***rufonotatus*** (Holmgren)
    - *breviventris* (Thomson)
- ***signifer*** (Thomson)
- ***t-nigrum*** (Thomson)

Tribe **IDIOGRAMMATINI**

IDIOGRAMMA Foerster
- ***alysiina*** (Thomson)

Subfamily **ADELOGNATHINAE**

ADELOGNATHUS Holmgren
- ***aciculatus*** Thomson
- ***brevicornis*** Holmgren
    - *limbatus* Thomson
- ***dimidiatus*** Thomson
- ***facialis*** Thomson
- ***fasciatus*** Thomson
- ***laevicollis*** Thomson
- ***nigriceps*** Thomson
- ***nigricornis*** Thomson
- ***pilosus*** Thomson
- ***puncticollis*** Thomson
- ***punctiventris*** Thomson
- ***punctulatus*** Thomson
- ***tetracinctorius*** (Thunberg)
    - *scabriculus* Thomson

Subfamily **XORIDINAE**

ODONTOCOLON Cushman
- ***dentipes*** (Gmelin)
  - *pinetorum* (Thomson)
- ***punctulatum*** (Thomson)
- ***quercinum*** (Thomson)

XORIDES Latreille
- ***glyptus*** (Thomson)

Subfamily **PHYGADEUONTINAE**

Tribe **PHYGADEUONTINI**

Subtribe **CHIROTICINA**

HANDAOIA Seyrig
- ***bellicornis*** (Thomson)

CHIROTICA Foerster
- ***maculipennis*** (Gravenhorst)
  - *glyptonotus* (Thomson)
- ***rubrotincta*** (Thomson)

Subtribe **ACROLYTINA**

EUDELUS Foerster
- ***simillimus*** (Taschenberg)
  - *pallicarpus* (Thomson)
  - *scabriculus* (Thomson)

ACROLYTA Foerster
- ***rufocincta*** (Gravenhorst)
  - *capreolus* (Thomson)

DIAGLYPTELLANA Horstmann
- ***opacula*** (Thomson)

Subtribe **HEMITELINA**

PLEUROGYRUS Townes
- ***cyclogaster*** (Thomson)

AROTREPHES Townes
- ***parvipennis*** (Thomson)

XIPHULCUS Townes
- ***constrictus*** (Thomson)
- ***floricolator*** (Gravenhorst)
  - *longulus* (Thomson)

HEMITELES Gravenhorst
- ***similis*** (Gmelin)
  - *unicolor* Thomson

ACLASTUS Foerster
- ***gracilis*** (Thomson)
- ***solutus*** (Thomson)

Subtribe **GELINA**

DICHROGASTER Doumerc
- ***aestivalis*** (Gravenhorst)
  - *geniculatus* (Thomson)
- ***heteropus*** (Thomson)
- ***liostylus*** (Thomson)
- ***longicaudatus*** (Thomson)

GELIS Thunberg
- ***albipalpus*** (Thomson)
- ***balteatus*** (Thomson)
- ***brevicauda*** (Thomson)
- ***breviceps*** (Thomson)
- ***elymi*** (Thomson)
- ***gibbifrons*** (Thomson)
- ***glacialis*** (Holmgren)
  - *aeneus* (Thomson)
- ***gonatopinus*** (Thomson)
- ***grandiceps*** (Thomson)
- ***infumatus*** (Thomson)
- ***longicauda*** (Thomson)
- ***mandibularis*** (Thomson)
- ***melanogaster*** (Thomson)
- ***myrmecinus*** (Thomson)
- ***ornatulus*** (Thomson)
- ***pilosus*** (Thomson) **comb. n.**
- ***rubricollis*** (Thomson)
- ***rugifer*** (Thomson)
- ***spinulus*** (Thomson)

AGASTHENES Foerster
- ***varitarsus*** (Gravenhorst)
  - *stagnalis* (Thomson)

Subtribe **GNYPETOMORPHINA**

GNYPETOMORPHA Foerster
- ***obscura*** (Bridgman)
  - *apertus* (Thomson)

Subtribe **MASTRINA**

PYGOCRYPTUS Roman
- ***grandis*** (Thomson)

MASTRUS Foerster
- ***costalis*** (Thomson)
- ***fumipennis*** (Thomson)
- ***rufulus*** (Thomson)

ISADELPHUS Foerster
- ***armatus*** (Gravenhorst)
  - *bidentulus* (Thomson)
- ***gallicola*** (Bridgman)
  - *nigriventris* (Thomson)
- ***inimicus*** (Gravenhorst)
  - *obscuripes* (Thomson)
  - *rubripes* (Thomson)

ZOOPHTHORUS Foerster
- ***cynipinus*** (Thomson)
- ***graculus*** (Gravenhorst)
  - *auriculatus* (Thomson)
- ***hirticeps*** (Thomson)
- ***microstomus*** (Thomson)
- ***notaticrus*** (Thomson)
- ***plumbeus*** (Thomson)
- ***punctiventris*** (Thomson)

MASTRULUS Horstmann
- ***capra*** (Thomson)

CLYPEOTELES Horstmann
- ***distans*** (Thomson)
  - *rugifrons* (Thomson)

LOCHETICA Kriechbaumer
- ***pimplaria*** (Thomson)

Subtribe **ETHELURGINA**

RHEMBOBIUS Foerster
- ? ***nigriceps*** (Thomson)
- ? ***nigricollis*** (Thomson)

Subtribe **ENDASEINA**

CHARITOPES Foerster
- ***areolaris*** (Thomson)
- ***clausus*** (Thomson)
- ***macrurus*** (Thomson)

MEDOPHRON Foerster
- ***armatulus*** (Thomson)
- ***caudatulus*** (Dalla Torre)
  - *caudatus* (Thomson) (homonym)
- ***flavitarsis*** (Dalla Torre)
  - *flavipes* (Thomson) (homonym)
- ***recurvus*** (Thomson)

ENDASYS Foerster
- ***analis*** (Thomson)
- ***eurycerus*** (Thomson)
- ***minutulus*** (Thomson)

GLYPHICNEMIS Foerster
- ***clypealis*** (Thomson)

AMPHIBULUS Kriechbaumer
- ***gracilis*** Kriechbaumer
  - *bispinus* (Thomson)

Subtribe **BATHYTRICHINA**

BATHYTHRIX Foerster
- ***aereus*** (Gravenhorst)
  - *brevis* (Thomson)
- ***collaris*** (Thomson)
- ***fragilis*** (Gravenhorst)
  - *geniculosus* (Thomson)
- ***linearis*** (Gravenhorst)
  - *heteropus* (Thomson)
- ***laminus*** (Thomson)
- ***rugulosus*** (Thomson)
- ***strigosus*** (Thomson)

Subtribe **PHYGADEUONTINA**

OECOTELMA Townes
- ***gracilipes*** (Thomson)

PLATYRHABDUS Townes
- ***inflatus*** (Thomson)
- ***monodon*** (Thomson)

SULCARIUS Townes
- ***biannulatus*** (Gravenhorst)
  - *homocerus* (Thomson)
- ***nigricornis*** (Thomson)

TROPISTES Gravenhorst
- ***falcatus*** (Thomson)

ORTHIZEMA Foerster
- ***hadrocerum*** (Thomson)
- ***triannulatum*** (Thomson)

TRICHOLINUM Foerster
- ***ischnocerum*** (Thomson)

STIBEUTES Foerster
- ? ***breviareolatus*** (Thomson)
- ***curvispina*** (Thomson)

THEROSCOPUS Foerster
- ***annulicornis*** (Thomson)
- ***faciator*** (Aubert)
  - *facialis* (Thomson) (homonym)
- ***fasciatulus*** Horstmann
  - *fasciatus* (Thomson) (homonym)
- ***melanopygus*** (Gravenhorst)
  - *validicornis* (Thomson)
- ***ochrogaster*** (Thomson)
- ? ***trochanteralis*** (Dalla Torre) **comb. n.**
  - *trochanteratus* (Thomson) (homonym)
- ***trochanteratus*** (Thomson)
- ***ungularis*** (Thomson)

PHYGADEUON Gravenhorst
- ? ***acutipennis*** Thomson
- ***alpinus*** (Thomson)
- ***arcticus*** (Thomson)
- ***bidens*** Thomson
- ***brachyurus*** Thomson
- ***brevitarsis*** Thomson
- ? ***canaliculatus*** Thomson
- ***cubiceps*** Thomson
- ***curviscapus*** Thomson
- ***dimidiatus*** Thomson
- ***flavicans*** Thomson
- ***grandiceps*** Thomson
- ? ***heterogaster*** Thomson
- ***inflatus*** Thomson
  - *infelix* Dalla Torre
- ***laeviventris*** Thomson
- ***lapponicus*** Thomson
- ***liogaster*** Thomson
- ***liosternus*** Thomson
- ***longigena*** Thomson
- ***magnicornis*** (Thomson)
- ***monodon*** Thomson
- ***ocularis*** Thomson
- ***oppositus*** Thomson
- ***ovaliformis*** Dalla Torre
  - *ovalis* Thomson (homonym)
- ***pallicarpus*** Thomson
  - *pallidicarpus* Dalla Torre (unjustified emendation)
- ***punctigena*** Thomson
- ***punctipleuris*** Thomson
- ***punctiventris*** Thomson
- ***ripicola*** Thomson
- ***rotundipennis*** Thomson
- ***rugipectus*** Thomson
- ***scaposus*** Thomson
- ***stilpninus*** Thomson
- ***submuticus*** Thomson
- ***tenuicosta*** Thomson
- ***tenuiscapus*** Thomson
- ***trichops*** Thomson
- ? ***ungularis*** Thomson
- ? ***varicornis*** Thomson

CERATOPHYGADEUON Viereck
- ***anurus*** (Thomson)
  - *parvicauda* (Thomson)
- ***longiceps*** (Thomson)

LEPTOCRYPTOIDES Horstmann
- ***clavipes*** (Thomson)

Subtribe STILPNINA

STILPNUS Gravenhorst
- ***angustatus*** Thomson
- ***crassicornis*** Thomson
- ***tenuipes*** Thomson

MESOLEPTUS Gravenhorst
- ***filicornis*** (Thomson)
- ***flavipes*** (Thomson) **comb. n.**
- ***marginatus*** (Thomson)
- ***petiolaris*** (Thomson)
- ***ripicola*** (Thomson)

ATRACTODES Gravenhorst
- ***alutaceus*** Thomson
- ***angustipennis*** Foerster
  - *flavicoxa* Thomson
- ***crassicornis*** Thomson
  - ? *intersectus* Foerster
- ***croceicornis*** Haliday
  - *compressus* Thomson
- ***eryptobius*** Foerster
  - *parallelus* Thomson
- ***pauxillus*** Foerster
  - *breviscapus* Thomson
- ***pusillus*** Foerster
  - *liogaster* Thomson
- ***tenuipes*** Thomson
- ***thomsoni*** (Dalla Torre)
  - *rufipes* Thomson (homonym)

Tribe PSEUDOCRYPTINI

JAVRA Cameron
- ***areolaris*** (Thomson) **comb. n.**
- ***opaca*** (Thomson)

PARMORTHA Townes
- ***pleuralis*** (Thomson)

CUBOCEPHALUS Ratzeburg
- ***annulitarsis*** (Thomson)
- ***femoralis*** (Thomson) **comb. n.**
- ***longicauda*** (Thomson) **comb. n.**
- ***nigriventris*** (Thomson)
- ***ruficoxis*** (Thomson) **comb. n.**
- ***sternocerus*** (Thomson)

ORESBIUS Marshall
- ***nigricornis*** (Thomson) **comb. n.**
- ***nigriventris*** (Thomson) **comb. n.**
- ***punctifer*** (Thomson) **comb. n.**
- ***septentrionalis*** (Thomson) **comb. n.**

POLYTRIBAX Foerster
- ***gravenhorsti*** (Thomson) **comb. n.**

ACONIAS Cameron
- ***pectoralis*** (Thomson) **comb. n.**

GIRAUDIA Foerster
- ***scansor*** (Thomson) **comb. n.**

SCHENKIA Foerster
- ***aries*** (Thomson) **comb. n.**
- ***opacula*** (Thomson)
- ***rubricollis*** (Thomson)

PLEOLOPHUS Townes
- ? ***alutaceus*** (Thomson)

APTESIS Foerster
- ***borealis*** (Thomson) **comb. n.**
- ***distans*** (Thomson)
- ***femoralis*** (Thomson)
- ***lapponica*** (Thomson) **comb. n.**
- ***nigritula*** (Thomson)
- ***ochrostomus*** (Thomson) **comb. n.**
- ***orbitalis*** (Thomson) **comb. n.**
- ***pectoralis*** (Thomson) **comb. n.**
- ***puncticollis*** (Thomson) **comb. n.**

Tribe MESOSTENINI

Subtribe AGROTHEREUTINA

APSILOPS Foerster
- ***aquaticus*** (Thomson) **comb. n.**

THRYBIUS Townes
- ***brevispina*** (Thomson) **comb. n.**
- ***leucopygus*** (Gravenhorst)
  - *drewseni* (Thomson)

AGROTHEREUTES Foerster
- ***abbreviator*** (Fabricius)
  - *dispar* (Thomson)
- ***fumipennis*** (Gravenhorst)
  - *zygaenarum* (Thomson)
- ***nasutus*** (Thomson) **comb. n.**
- ***tibialis*** (Thomson)

MESOSTENIDEA Viereck
- ***obnoxius*** (Gravenhorst)
  - *subcircularis* (Thomson)
  - *subovalis* (Thomson)

GAMBRUS Foerster
- ***inferus*** Thomson
- ***ornatulus*** (Thomson)
- ***palustris*** (Thomson) **comb. n.**
- ***superus*** Thomson

ARITRANIS Foerster
- ***elegans*** (Thomson) **comb. n.**
- ***fugitivus*** (Gravenhorst)
  - *binotatulus* (Thomson)
- ***graefei*** (Thomson) **comb. n.**
- ***mesoxanthus*** (Thomson) **comb. n.**
- ***pulcher*** (Thomson) **comb. n.**

HIDRYTA Foerster
- ***frater*** (Cresson)
  - *erythrocerus* (Thomson)
- ***fusiventris*** (Thomson)
- ***sordidula*** (Thomson)

IDIOLISPA Foerster
- ***tenuicornis*** (Thomson)

TRYCHOSIS Foerster
- ***glabriculus*** (Thomson)
- ***gradarius*** (Tschek)
  - *nitidulus* (Thomson)
- ***ingratus*** (Tschek)
  - *macrourus* (Thomson)

- ***legator*** (Thunberg)
  - *clypearis* (Thomson)
  - *pictus* (Thomson)
- ***mesocastanus*** (Tschek)
  - *annulicornis* (Thomson)
- ***neglectus*** (Tschek)
  - *annulitarsis* (Thomson)
- ***pauper*** (Tschek)
  - *lapponicus* (Thomson)
- ***tristator*** (Tschek)
  - *pleuralis* (Thomson)

Subtribe **HEDYCRYPTINA**

ENCLISIS Townes
- ***inflatus*** (Thomson) **comb. n.**
- ***laticrus*** (Thomson) **comb. n.**
- ***nubifer*** (Thomson) **comb. n.**
- ***pubiventris*** (Thomson) **comb. n.**
- ***striolatus*** (Thomson) **comb. n.**
- ***tener*** (Thomson) **comb. n.**

ISCHNUS Gravenhorst
- ***orbitatorius*** (Thomson)
- ***punctiger*** (Thomson)

BUATHRA Cameron
- ***tarsoleuca*** (Schrank)
  - *curvicauda* (Thomson)

ITAMOPLEX Foerster
- ***arenicola*** (Thomson) **comb. n.**
- ***dianae*** (Gravenhorst)
  - *borealis* (Thomson)
- ***subquadratus*** (Thomson)
- ***titubator*** (Thunberg)
  - *infumatus* (Thomson)

XYLOPHRURUS Foerster
- ***apum*** (Thomson) **comb. n.**
- ***coraebi*** (Thomson)
  - *coroebi* misspelling
- ***lancifer*** (Gravenhorst)
  - *dispar* (Thunberg) (homonym)
  - *dentifer* (Thomson)
- ***nigricornis*** (Thomson) **comb. n.**

MERINGOPUS Foerster
- ***nigerrimus*** (Fonscolombe)
  - *serratus* (Thomson)
- ***titillator*** (Linnaeus)
  - *latitarsis* (Thomson)

Subtribe **MESOSTENINA**

MESOSTENUS Gravenhorst
- ***crassifemur*** Thomson
- ***dentifer*** Thomson

Subtribe **ATELEUTINA**

ATELEUTE Foerster
- ***linearis*** Foerster
  - *lissonotoides* (Thomson)

Subtribe **SPHECOPHAGINA**

SPHECOPHAGA Westwood
- ***vesparum*** (Curtis)
  - *sericea* (Thomson)

Nomina dubia in PHYGADEUONTINAE

HEMITELES Gravenhorst
- ***australis*** Thomson (nomen dubium)
- ***fuscicarpus*** Thomson (nomen dubium)
- ***liambus*** Thomson (nomen dubium)
- ***obliquus*** Thomson (nomen dubium)
- ***thomsoni*** Schmiedeknecht (nomen dubium)
  - *dispar* Thomson (homonym)

MICROCRYPTUS Thomson
- ***ornaticeps*** Thomson (nomen dubium)

PEZOMACHUS Gravenhorst
- ***numidicus*** Thomson (nomen dubium)

Subfamily **BANCHINAE**

Tribe **GLYPTINI**

APOPHUA Morley
- ***cicatricosa*** (Ratzeburg)
  - *crenulata* (Thomson)

GLYPTA Gravenhorst
- ***brevipetiolata*** Thomson
- ***caudata*** Thomson
- ***consimilis*** Holmgren
  - *xanthognatha* Thomson
- ***crassitarsis*** Thomson
  - *breviventris* Thomson
  - *tenuitarsis* Thomson
- ***dentifera*** Thomson
- ***extincta*** Ratzeburg
  - *nigriventris* Thomson
- ***femorator*** Desvignes
  - *filicornis* Thomson
- ***heterocera*** Thomson
- ***microcera*** Thomson
- ***nigricornis*** Thomson
- ***nigrina*** Desvignes
  - *fractigena* Thomson
- ***nigroplica*** Thomson
- ***salicis*** Thomson
- ***scutellaris*** Thomson
- ***similis*** Bridgman
  - *rufipes* Thomson (homonym)
  - *thomsonii* Dalla Torre
- ***tegularis*** Thomson
- ***tenuicornis*** Thomson
- ***varicoxa*** Thomson

Tribe **LISSONOTINI**

LISSONOTA Gravenhorst
- ***antennalis*** Thomson
- ***biguttata*** Holmgren
  - *crassipes* Thomson
- ***buccator*** (Thunberg)
  - *varicoxa* Thomson
- ***clypealis*** Thomson
- ***coracina*** (Gmelin)
  - *irrigua* Thomson
- ***digestor*** (Thunberg)
  - *hians* Thomson

- ***errabunda*** Holmgren
  - *punctiventris* Thomson
  - ? *buccator* (Thunberg)
- ***folii*** Thomson
- ***gracilipes*** Thomson
- ***humerella*** Thomson
- ***impressifrons*** Thomson
- ***nigridens*** Thomson
- ***palpalis*** (Thomson)
- ***quadrinotata*** Gravenhorst
  - *carinifrons* Thomson
- ***rimator*** Thomson
- ***saturator*** (Thunberg)
  - *basalis* Thomson (homonym)
  - *mutanda* Schmiedeknecht
- ***tenerrima*** Thomson

CRYPTOPIMPLA Taschenberg

- ***genalis*** (Thomson)
- ***subfumata*** (Thomson)

SYZEUCTUS Foerster

- ***tenuifasciatus*** Schmiedeknecht
  - *punctiventris* (Thomson) (homonym)

Tribe BANCHINI

EXETASTES Gravenhorst

- ***guttifer*** Thomson

BANCHUS Fabricius

- ***hastator*** (Fabricius)
  - *femoralis* Thomson

Subfamily CTENOPELMATINAE

Tribe CTENOPELMATINI

CTENOPELMA Holmgren

- ***verticinum*** Thomson

XENOSCHESIS Foerster

- ***mordax*** (Thomson)

HOMASPIS Foerster

- ***robustus*** (Thomson)
- ***varicolor*** (Thomson)

Tribe PIONINI

LETHADES Davis

- ***curvispina*** (Thomson) **comb. n.**
- ***scabriculus*** (Thomson)

HODOSTATES Foerster

- ***brevis*** (Thomson)

TREMATOPYGUS Holmgren

- ***lethierryi*** Thomson
- ***melanocerus*** (Gravenhorst)
  - *kriechbaumeri* Thomson

GLYPTORHAESTUS Thomson

- ***punctatus*** (Thomson)
- ***punctulatus*** (Woldstedt)
  - *wuestneii* (Thomson)

RHORUS Foerster

- ***angulatus*** (Thomson)
- ***longigena*** (Thomson)

PHAESTUS Foerster

- ***anomalus*** (Brischke)
  - *heterocerus* Thomson

SYNTACTUS Foerster

- ***fusiformis*** (Thomson) **comb. n.**
- ***scabriculus*** (Thomson) **comb. n.**

RHAESTUS Thomson

- ***femoralis*** Thomson

SYMPHERTA Foerster

- ***canaliculata*** (Thomson)
- ***sulcata*** (Thomson)

ASTHENARA Foerster

- ***crassifemur*** (Thomson)

Tribe PERILISSINI

LATHIPONUS Foerster

- ***frigidus*** (Woldstedt)
  - *pulcherrimus* (Thomson)

SYNOCOETES Foerster

- ***anterior*** (Thomson) **comb. n.**

PERILISSUS Holmgren

- ***albitarsis*** Thomson
- ***compressus*** Thomson
- ***coxalis*** Thomson
- ***emarginatus*** Thomson
- ***frontator*** Thomson
- ***spiniger*** Thomson

LATHROLESTES Foerster

- ***caudatus*** (Thomson)
- ***grandiceps*** (Thomson)
- ***luteolus*** (Thomson)
- ***marginatus*** (Thomson)
- ***nigricollis*** (Thomson) **comb. n.**
- ***pleuralis*** (Thomson)
- ***ungularis*** (Thomson)

Tribe MESOLEIINI

OTLOPHORUS Foerster

- ***hypomelas*** (Thomson)
- ***melanocarus*** (Thomson)

LAGAROTIS Foerster

- ? ***didymus*** (Thomson)

BARYTARBES Foerster

- ***annulipes*** (Thomson)
- ***flavoscutellatus*** (Thomson)
- ***laeviusculus*** (Thomson)

ALEXETER Forester

- ***albilabris*** (Thomson)

PROTARCHUS Foerster

- ***grandis*** (Thomson)
- ***melanurus*** (Thomson)

PERISPUDA Foerster

- ***flavitarsis*** (Thomson)

LAMACHUS Foerster

- ***castaneiventris*** (Thomson)
- ***thomsoni*** Fitton **nom. n.**
  - *longiventris* (Thomson) (homonym)

NEOSTROBLIA Heinrich
longigena (Thomson) **comb. n.**

SCOPESIS Foerster
depressus (Thomson)
macropus (Thomson)
tegularis (Thomson)

HIMERTA Foerster
bisannulata (Thomson)

RHINOTORUS Foerster
confusus (Thomson) **comb. n.**
mesocastanus (Thomson) **comb. n.**
subimpressus (Thomson) **comb. n.**

ARBELUS Townes
? ***sanguinipes*** (Thomson) **comb. n.**

CAMPODORUS Foerster
clypealis (Thomson)
crassipes (Thomson)
crassitarsis (Thomson)
curtitarsis (Thomson)
deletus (Thomson)
gallicus (Thomson)
glyptus (Thomson)
humerellus (Thomson)
incidens (Thomson)
laevipectus (Thomson)
latiscapus (Thomson)
liosternus (Thomson)
lobatus (Thomson)
mandibularis (Thomson)
nemati (Thomson)
nigridens (Thomson)
pineti (Thomson)
pleuralis (Thomson)
? ***stenocerus*** (Thomson) **comb. n.**
tenuitarsis (Thomson)

SMICROLIUS Thomson
parvicalcar (Thomson)

MESOLEIUS Holmgren
brevipalpis Thomson
frenalis Thomson
frontatus Thomson
? ***immarginatus*** Thomson
incisus Thomson
obliquus Thomson
picticoxa Thomson
sinuatus Thomson
stenostigma Thomson
subroseus Thomson
rubidus Thomson
varicoxa Thomson

HYPERBATUS Foerster
segmentator (Holmgren)
  orbitalis (Thomson)

SAOTIS Foerster
brevispina (Thomson)
compressiusculus (Thomson)
dorsatus (Thomson)
emarginatus (Thomson)
heteropus (Thomson)
liopleuris (Thomson)
longiventris (Thomson)
nigriscuta (Thomson)
nigriventris (Thomson)
tricolor (Thomson)
varicoxa (Thomson)

ANONCUS Townes
brachypus (Thomson)
brevitarsis (Thomson)
femorator (Thomson)

Nomen dubium in MESOLEIINI

MESOLEIUS Holmgren
mesoxanthus Thomson (nomen dubium)

Tribe **EURYPROCTINI**

SYNOMELIX Foerster
curvulus (Thomson)

SYNODITES Foerster
facialis (Thomson) **comb. n.**
lineiger (Thomson) **comb. n.**
orbitalis (Thomson)
parviceps (Thomson)
subscaber (Thomson)

MESOLEPTIDEA Viereck
flavicornis (Thomson) **comb. n.**
holmgreni (Thomson) **comb. n.**

HADRODACTYLUS Foerster
bidentulus Thomson
confusus (Holmgren)
  albicoxa Thomson
femoralis (Holmgren)
  nigricoxa (Thomson)
genalis Thomson
gracilipes Thomson
insignis (Kriechbaumer)
  varicoxa (Thomson)
nigrifemur Thomson
tarsator Thomson
tiphae (Geoffroy)
  laticeps Thomson
villosulus Thomson

SYNDIPNUS Foerster
atricornis (Thomson)
macrocerus (Thomson)
pectoralis Thomson
punctiscuta Thomson

PHOBETES Foerster
femorator (Thomson)
fulviventris (Thomson) **comb. n.**
latipes (Thomson) **comb. n.**
liopleuris (Thomson)
rufipes (Thomson) **comb. n.**

EURYPROCTUS Holmgren
crassicornis Thomson
exareolatus Thomson
inferus Thomson
nitidulus Thomson
parvulus Thomson

Subfamily CAMPOPLEGINAE

Tribe CAMPOPLEGINI

SINOPHORUS Foerster
- ***costalis*** (Thomson)
- ***crassifemur*** (Thomson)
- ***fuscicarpus*** (Thomson)
- ? ***nigritellus*** (Thomson) **comb. n.**
- ***pineticola*** (Thomson)
- ***planiscapus*** (Thomson)
- ***pleuralis*** (Thomson) **comb. n.**
- ***rufifemur*** (Thomson)
- ***tegularis*** (Thomson) **comb. n.**

CAMPOPLEX Gravenhorst
- ***angulatus*** (Thomson)
- ***bilobus*** (Thomson)
- ***cerophagus*** Gravenhorst
  - *picticrus* (Thomson)
- ***clypearis*** (Thomson)
- ***continuus*** (Thomson)
- ***coracinus*** (Thomson)
- ***forticosta*** (Thomson)
- ***fusciplica*** (Thomson)
- ***fusicornis*** (Thomson) **comb. n.**
- ***hadrocerus*** (Thomson)
- ***liogaster*** (Thomson)
- ***litoreus*** (Thomson)
- ***lyratus*** (Thomson)
- ***melampus*** (Thomson) **comb. n.**
- ***ruficoxa*** (Thomson)
- ***scaposus*** (Thomson) **comb. n.**

CASINARIA Holmgren
- ***alpina*** Thomson
- ***ischnogaster*** Thomson
- ***monticola*** Thomson
- ***orbitalis*** (Gravenhorst)
  - *alboscutellaris* Thomson
- ***protensa*** Thomson
- ***scabra*** Thomson
- ***subglabra*** Thomson

Tribe LIMNERIINI

NEMERITIS Holmgren
- ***caudatula*** Thomson
- ***lativentris*** Thomson
- ***stenura*** Thomson

BATHYPLECTES Foerster
- ***anurus*** (Thomson)
  - *contracta* (Thomson)
- ***balteatus*** (Thomson)
- ***corvinus*** (Thomson)
- ***curculionis*** (Thomson)
- ***rostratus*** (Thomson)
- ***stenostigma*** (Thomson)

BIOLYSIA Schmiedeknecht
- ***immolator*** (Gravenhorst)
  - *marginella* (Thomson)
- ***tristis*** (Gravenhorst)
  - *trochantella* (Thomson)

CALLIDORA Foerster
- ***albovincta*** (Holmgren)
  - *annellata* (Thomson)

NEPIESTA Foerster
- ***subclavata*** Thomson

GONOTYPUS Foerster
- ***melanostoma*** (Thomson)

PYRACMON Holmgren
- ***truncicola*** Thomson
  - *lateralis* Thomson

SPUDASTICA Foerster
- ***kriechbaumeri*** (Bridgman)
  - *petiolaris* Thomson

SYNETAERIS Foerster
- ***carbonella*** Thomson
- ***heteropus*** Thomson

CAMPOLETIS Foerster
- ***brachycera*** (Thomson)
- ***erythropa*** (Thomson)
- ***macroura*** (Thomson)
- ***mucronella*** (Thomson)
- ***varians*** (Thomson)

DUSONA Cameron
- ***angustata*** (Thomson)
- ***bifida*** (Thomson)
- ***castanipes*** (Thomson) **comb. n.**
- ***crassipes*** (Thomson)
- ***flaviscapus*** (Thomson)
- ***genalis*** (Thomson)
- ***limnobia*** (Thomson)
- ***luteipes*** (Thomson)
- ***opaca*** (Thomson)
- ***polita*** (Foerster)
  - *latungula* (Thomson)
  - *splendens* (Thomson)
- ***recta*** (Thomson) **comb. n.**
- ***spinipes*** (Thomson)
- ***stenocarus*** (Thomson)

CYMODUSA Holmgren
- ***convergens*** (Thomson)
- ***longicalcar*** Thomson

DOLOPHRON Foerster
- ***latiusculus*** (Thomson) **comb. n.**

PHOBOCAMPE Foerster
- ***alticollis*** (Thomson)
- ***confusa*** (Thomson)
- ***flavicincta*** (Thomson)
- ***pulchella*** (Thomson)

TRANOSEMA Foerster
- ***exoleta*** (Thomson)
- ***hyperborea*** (Thomson)
- ***nigridens*** (Thomson)
  - *striolata* (Thomson)
- ***rostralis*** (Brischke)
  - *arenicola* Thomson

ENYTUS Cameron
- ***apostatus*** (Gravenhorst)
  - ? *crataegellae* (Thomson)

DIADEGMA Foerster
- ***annulicrus*** (Thomson)
- ***anura*** (Thomson)
- ***brevivalvis*** (Thomson)
- ***crassiseta*** (Thomson)
- ***elongata*** (Thomson)
- ***holopyga*** (Thomson)
- ***hygrobia*** (Thomson)
  - *ischnocera* (Thomson)
- ***lacticrus*** (Thomson)
- ***latungula*** (Thomson)
- ***maculata*** (Gravenhorst)
  - *polyzona* (Thomson)
- ***majalis*** (Gravenhorst)
  - *claripennis* (Thomson)
- ***melania*** (Thomson)
- ***micrura*** (Thomson)
- ***monospila*** (Thomson)
- ***parvicanda*** (Thomson)
  - *parvicauda* misspelling
- ***rimator*** (Thomson)
- ***sordipes*** (Thomson)
- ***specularis*** (Thomson)
- ***tenuipes*** (Thomson)
- ***trochanterata*** (Thomson)
- ***truncata*** (Thomson)
  - *subbuccata* (Thomson)

HYPOSOTER Foerster
- ***boops*** (Thomson)
- ***coxator*** (Thomson) **comb. n.**
- ***facialis*** (Thomson)
- ***leucomerus*** (Thomson)
- ***longulus*** (Thomson) **comb. n.**
- ***neglectus*** (Holmgren)
  - *varicoxa* (Thomson)
- ***pectinatus*** (Thomson)
- ***picticollis*** (Thomson)
- ***ruficrus*** (Thomson)
- ***tenuicosta*** (Thomson)
- ***vividus*** (Holmgren)
  - *albicrus* (Thomson)

OLESICAMPE Foerster
- ***alboplica*** (Thomson)
- ***annulitarsis*** (Thomson) **comb. n.**
- ***basalis*** (Thomson)
- ***bergmanni*** (Thomson) **comb. n.**
- ***binotata*** (Thomson)
- ***buccata*** (Thomson) **comb. n.**
- ***cavigena*** (Thomson)
- ***crassitarsis*** (Thomson)
- ***curtigena*** (Thomson) **comb. n.**
- ***femorella*** (Thomson)
- ***flavicornis*** (Thomson)
- ***frutetorum*** (Thomson)
- ***fulcrans*** (Thomson)
- ***geniculella*** (Thomson)
- ***gracilipes*** (Thomson)
- ***heterogaster*** (Thomson) **comb. n.**
- ***luteipes*** (Thomson)
- ***melanogaster*** (Thomson **comb. n.**
- ***nigricoxa*** (Thomson)
- ***nigroplica*** (Thomson)
- ***patellana*** (Thomson)
- ***punctitarsis*** (Thomson)
- ***radiella*** (Thomson)
- ***retusa*** (Thomson)
- ***simplex*** (Thomson)
- ***sinuata*** (Thomson) **comb. n.**
- ***spireae*** (Thomson) **comb. n.**
- ***sternella*** (Thomson)
- ***subcallosa*** (Thomson)
- ***tarsator*** (Thomson) **comb. n.**

LATHROSTIZUS Foerster
- ***forticanda*** (Thomson)
  - *forticauda* misspelling
- ***macrostoma*** (Thomson)
- ***monilicornis*** (Thomson)
- ***punctipes*** (Thomson)
- ***sternocerus*** (Thomson)

ECHTHRONOMAS Foerster
- ***quadrinotata*** (Thomson)

Subfamily CREMASTINAE

PRISTOMERUS Curtis
- ***pallidus*** Thomson

DIMOPHORA Foerster
- ***evanialis*** (Gravenhorst)
  - *annellatus* (Thomson)
- ***robusta*** Brischke
  - *arenicola* (Thomson)

CREMASTUS Gravenhorst
- ***crassicornis*** Thomson
- ***lineatus*** Gravenhorst
  - *radialis* Thomson
- ***pungens*** Gravenhorst
  - *laeviusculus* Thomson

TEMELUCHA Foerster
- ***guttifer*** (Thomson)
- ***ophthalmica*** (Holmgren)
  - *macrostigma* (Thomson)
- ***schoenobia*** (Thomson)
- ***subnasuta*** (Thomson)

Subfamily TERSILOCHINAE

MICRODIAPARSIS Horstmann
- ***versutus*** (Holmgren)
  - *parviceps* (Thomson)

BARYCNEMIS Foerster
- ***anurus*** (Thomson)
- ***caudatulus*** (Thomson)
- ***filicornis*** (Thomson)
- ***gracillimus*** (Thomson)
- ***laeviceps*** (Thomson)

GONOLOCHUS Foerster
- ***fenestralis*** (Thomson)

PECTINOLOCHUS Aubert
- ***ensifer*** (Brischke)
  - *crassicauda* (Thomson)

- ***striolus*** (Thomson)

RUGODIAPARSIS Horstmann
- ***crassipes*** (Thomson)

TERSILOCHUS Holmgren
- ***filicornis*** (Thomson)
- ***heterocerus*** (Thomson)
- ***liopleuris*** (Thomson)
- ***longicornis*** (Thomson)
- ***melanogaster*** (Thomson)
- ***obliquus*** (Thomson)
- ***subdepressus*** (Thomson)

PHRADIS Foerster
- ***brevis*** (Brischke)
  - *temporalis* (Thomson)
- ***decrescens*** (Thomson)
- ***interstitialis*** (Thomson)

HETEROCOLA Foerster
- ***proboscidalis*** (Thomson)
  - *monticola* (Thomson)
  - *pallicarpus* (Thomson)

DIAPARSIS Foerster
- ***carinifer*** (Thomson)
- ***nutritor*** (Fabricius)
  - *genalis* (Thomson)
- ***stramineipes*** (Brischke)
  - *flavicornis* (Thomson)

NANODIAPARSIS Horstmann
- ***apertus*** (Thomson)

ANEUCLIS Foerster
- ***brevicauda*** (Thomson)
- ***incidens*** (Thomson)
- ***maritimus*** (Thomson)

Subfamily **OPHIONINAE**

OPHION Fabricius
- ***distans*** Thomson
- ***longigena*** Thomson
- ***scutellaris*** Thomson

Subfamily **MESOCHORINAE**

ASTIPHROMMA Foerster
- ***buccatum*** (Thomson)
- ***graniger*** (Thomson)
- ***hamulum*** (Thomson)
- ***incidens*** (Thomson)
- ***mandibulare*** (Thomson)
- ***plagiatum*** (Thomson)
- ***simplex*** (Thomson)
- ***tenuicornis*** (Thomson)

MESOCHORUS Gravenhorst
- ***acuminatus*** Thomson
- ***albipes*** Thomson
- ***angustatus*** Thomson
- ***brevicollis*** Thomson
- ***brevigena*** Thomson
- ***crassicrus*** Thomson
- ***curvicauda*** Thomson
- ***curvulus*** Thomson
- ***fulvus*** Thomson
- ***lapponicus*** Thomson
- ***longicauda*** Thomson
- ***macrurus*** Thomson
- ***marginatus*** Thomson
- ***nigriceps*** Thomson
- ***orgyiae*** Dalla Torre
  - *stigmaticus* Thomson (homonym)
- ***picticrus*** Thomson
- ***punctipleuris*** Thomson
- ***salicis*** Thomson
- ***suecicus*** Dalla Torre
  - *pectinipes* Thomson (homonym)
- ***temporalis*** Thomson
- ***tenuiscapus*** Thomson
- ***tuberculiger*** Thomson

STICTOPISTHUS Thomson
- ***bilineatus*** (Thomson)
- ***convexicollis*** (Thomson)
- ***laticeps*** (Thomson)

Subfamily **METOPIINAE**

CHORINAEUS Holmgren
- ***australis*** Thomson (nomen dubium)
- ***brevicalcar*** Thomson
- ***longicalcar*** Thomson
- ***longicornis*** Thomson

TRIECES Townes
- ***facialis*** (Thomson)
- ***nitifrons*** (Thomson)

METOPIUS Panzer
- ***brevispina*** Thomson
- ***clypealis*** Thomson
- ***croceicornis*** Thomson
- ***interruptus*** Thomson

TRICLISTUS Foerster
- ***albicinctus*** Thomson
- ***areolatus*** Thomson
- ***facialis*** Thomson
- ***lativentris*** Thomson
- ***longicalcar*** Thomson
- ***pallipes*** Holmgren
  - *nitrifrons* Thomson
- ***pubiventris*** Thomson
- ***spiracularis*** Thomson

EXOCHUS Gravenhorst
- ***annulitarsis*** Thomson
- ***anospilus*** Thomson
- ***australis*** Thomson
- ***citripes*** Thomson
- ***crassicornis*** Thomson
- ***incidens*** Thomson
- ***lineifrons*** Thomson
- ***longicornis*** Thomson
- ***nigripalpis*** Thomson
- ***parvispina*** Thomson
- ***signifrons*** Thomson
  - *nigrifrons* misspelling

Subfamily **ANOMALONINAE**

Tribe **THERIONINI**

BARYLYPA Foerster
delictor (Thunberg)
genalis (Thomson)
pallida (Gravenhorst)
laticeps (Thomson)

THERION Curtis
giganteum (Gravenhorst)
pyramidatus (Thomson)

GRAVENHORSTIA Boie (***ERIGORGUS*** Foerster)
cerinops (Gravenhorst)
lapponicum (Thomson)
claripennis (Thomson)
fibulator (Gravenhorst)
annulitarse (Thomson)
orbitale (Thomson)
varicorne (Thomson)

AGRYPON Foerster
rugifer (Thomson)
stenostigma (Thomson)

Subfamily **ACAENITINAE**

COLEOCENTRUS Gravenhorst
heteropus Thomson

Subfamily **OXYTORINAE**

MICROLEPTES Gravenhorst
glabriventris (Thomson) **comb. n.**
rectangulus (Thomson) **comb. n.**

OXYTORUS Foerster
armatus Thomson

ALLOMACRUS Foerster
pimplarius Thomson

PROCLITUS Foerster
heterocerus (Thomson)
longitarsis (Thomson)

DIALIPSIS Foerster
exilis Foerster
crassipes (Thomson)

PLECTISCIDEA Viereck
bistriatus (Thomson)
curticauda (Thomson) **comb. n.**
eurystigma (Thomson)
subteres (Thomson)

APERILEPTUS Foerster
obliquus (Thomson)

BLAPTICUS Foerster
crassulus Thomson
dentifer Thomson

SYMPLECIS Foerster
facialis Thomson

EUSTERINX Foerster
pusilla (Zetterstedt)
trichops (Thomson)

HELICTES Haliday
pilicornis (Thomson)

MEGASTYLUS Schiødte
pleuralis Thomson

Subfamily **COLLYRIINAE**

COLLYRIA Schiødte
coxator (Villers)
puncticeps (Thomson)
trichophthalma (Thomson)

Subfamily **ORTHOCENTRINAE**

ORTHOCENTRUS Gravenhorst
petiolaris Thomson
radialis Thomson

PICROSTIGEUS Foerster
recticauda (Thomson)

STENOMACRUS Foerster
cubiceps (Thomson)
curvulus (Thomson)
deletus (Thomson)
exserens (Thomson)
fortipes (Thomson)
innotatus (Thomson)
superus (Thomson)
ungula (Thomson)

LEIPAULUS Townes
?***flavicornis*** (Thomson) **comb. n.**

NEURATELES Ratzeburg
compressus (Thomson) **comb. n.**
crassicornis (Thomson) **comb. n.**
falcatus (Thomson) **comb. n.**

Subfamily **DIPLAZONTINAE**

SYRPHOCTONUS Foerster
crassicornis (Thomson) **comb. n.**
brevicornis (Thomson)
crassicrus (Thomson)
incisus (Thomson) **comb. n.**
longiventris (Thomson)
megaspis (Thomson) **comb. n.**
signatus (Gravenhorst)
hygrobius (Thomson)

ENIZEMUM Foerster
nigricornis (Thomson)

CAMPOCRASPEDON Uchida
caudatus (Thomson)

PHTHORIMA Foerster
xanthaspis (Thomson) **comb. n.**

DASCHIA Diller
brevitarsis (Thomson)

DIPLAZON Nees
deletus (Thomson)
varicoxa (Thomson)

PROMETHES Foerster
melanaspis (Thomson)
nigriventris (Thomson)

SUSSABA Cameron
- ***cognata*** (Holmgren)
  - *albicoxa* (Thomson)
- ***pulchella*** (Holmgren)
  - *laticarpus* (Thomson)
- ***punctiventris*** (Thomson)

Subfamily **ICHNEUMONINAE**

Tribe **PROTICHNEUMONINI**

COELICHNEUMON Thomson
- ***anospilus*** (Thomson) **comb. n.**
- ***coactus*** (Thomson)
- ***decrescens*** (Thomson)
- ***liocnemis*** (Thomson)
- ***tenuitarsis*** (Thomson) **comb. n.**
- ***truncatulus*** (Thomson)

Tribe **LISTRODROMINI**

ANISOBAS Wesmael
- ***parviceps*** (Thomson)
- ***platystylus*** (Thomson)

Tribe **ICHNEUMONINI**

STENICHNEUMON Thomson
- ***simulosus*** (Thomson)
  - *rimulosus* misspelling

CRATICHNEUMON Thomson
- ***albiscuta*** (Thomson)
- ***anotylus*** (Thomson) **comb. n.**
- ***cyaneoviridis*** (Thomson)
- ***grandiceps*** (Thomson) **comb. n.**
- ***liostylus*** (Thomson)
- ***pallitarsis*** (Thomson)
- ***parviscopa*** (Thomson) **comb. n.**
- ***stenocarus*** (Thomson)

EUPALAMUS Wesmael
- ***wesmaeli*** (Thomson)

BARICHNEUMON Thomson
- ***digrammus*** (Gravenhorst)
  - *nudicoxa* (Thomson)
- ***mesostilpnus*** (Thomson) **comb. n.**

ICHNEUMON Linnaeus
- ***acuticornis*** Thomson
- ***aequicalcar*** Thomson
- ***arctobius*** Thomson
- ***boreellus*** Thomson
- ***chrysostomus*** Thomson
- ***corfitzi*** Thomson
  - *jesperi* Thomson
- ***crassifemur*** Thomson
- ***crassitarsis*** Thomson
- ***euryceros*** Thomson
- ***gibbulus*** Thomson
- ***grandicornis*** Thomson
- ***hypolius*** Thomson
- ***inquinatus*** Wesmael
  - *brevigena* Thomson
- ***leucopeltis*** Thomson
- ***longeareolatus*** Thomson
- ***macrocerus*** Thomson
- ***micropnygus*** Thomson
  - *spiracularis* Thomson (homonym)
- ***minutorius*** Desvignes
  - *captorius* Thomson
- ***monospilus*** Thomson
- ***nereni*** Thomson
- ***nordenstromi*** Thomson
- ***quadriannellatus*** Thomson
  - *quadriannulatus* Thomson (homonym)
- ***quinquenotatus*** Thomson
- ***stenocerus*** Thomson
- ***subquadratus*** Thomson
- ***trispilus*** Thomson
- ***xanthognathus*** Thomson

CTENICHNEUMON Thomson
- ***circulator*** (Thomson)

SPILICHNEUMON Thomson
- ***limnophilus*** (Thomson) **comb. n.**
- ***simplicidens*** (Thomson)
- ***stagnicola*** (Thomson)

SPILOTHYRATELES Heinrich
- ***truncicola*** (Thomson) **comb. n.**

DIPHYUS Kriechbaumer
- ***longigena*** (Thomson)
- ***triplicatus*** (Thomson) **comb. n.**

AMBLYTELES Wesmael
- ***anurus*** Thomson (nomen dubium)

TRICHOLABUS Thomson
- ***femoralis*** (Thomson)

Tribe **EURYLABINI**

EURYLABUS Wesmael
- ***larvatus*** (Christ)
  - *vinulator* Thomson

Tribe **PLATYLABINI**

PLATYLABUS Wesmael
- ***concinnus*** Thomson
- ***muticus*** Thomson
- ***opaculus*** (Thomson)
- ***punctifrons*** (Thomson)
- ***transversus*** Bridgman
  - *lativentris* Thomson

ASTHENOLABUS Heinrich
- ***latiscapus*** (Thomson)

Tribe **PHAEOGENINI**

HETERISCHNUS Wesmael
- ***coxator*** (Thomson) **comb. n.**
- ***pulchellus*** (Thomson) **comb. n.**

HEMICHNEUMON Wesmael
- ***fuscipes*** Thomson

TRACHYARUS Thomson
- ***corvinus*** Thomson

DICAELOTUS Wesmael
- ***annellatus*** Thomson
- ***crassifemur*** Thomson
- ***inflexus*** Thomson
- ***orbitalis*** Thomson

pentagonus (Thomson) **comb. n.**
punctiventris (Thomson)
EPITOMUS Foerster
parvus Thomson
DIADROMUS Wesmael
arcticus Thomson
medialis Thomson
COLPOGNATHUS Wesmael
armatus Thomson
divisus Thomson
CENTETERUS Wesmael
nigricornis Thomson
EPARCES Foerster
grandiceps Thomson
AETHECERUS Wesmael
graniger Thomson
pallicoxa Thomson
DIROPHANES Foerster
ruficoxa (Thomson)
BAEOSEMUS Foerster
oenescens (Thomson)
aenescens misspelling
PHAEOGENES Wesmael
crassidens Thomson
elongatus Thomson
montanus Thomson
tegularis Thomson

Species incorrectly attributed to Thomson

For various reasons the following species have been incorrectly attributed to Thomson.

Campoplex auriculatus Foerster (Thomson, 1887*c*: 1071). For reasons not stated Aubert (1966: 130) attributed this species to Thomson and 'designated' a 'lectotype' for it.

Glypta tenuiventris. See catalogue entry for *G. tenuitarsis*.

Microcryptus nigriventris. Aubert's reference (1966: 129) to this species is presumably an error for *Mesocryptus nigriventris* (Thomson).

Pimpla lapponica Zetterstedt (Thomson, 1877: 746). This is technically an 'incorrect subsequent spelling' (*Code*, Article 33) of *Pimpla arctica* Zetterstedt. Thomson himself (1888*b*: 1250) drew attention to the error.

Trichomastix pallipes Holmgren (Thomson, 1890: 1473). This is technically an 'incorrect subsequent spelling' of *Bassus flavipes* Holmgren. Dalla Torre (1901: 242) first drew attention to the error.

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D. J. Lewis

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Vol 45 No 2

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A taxonomic review of the genus *Phlebotomus* (Diptera: Psychodidae)

D. J. Lewis

c/o Department of Entomology, British Museum (Natural History), Cromwell Road, London SW7 5BD

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Synopsis

The 11 subgenera (one new), 96 species (one new) and 17 subspecies of *Phlebotomus* are reviewed and keys are provided for their identification. Accounts are given of fossil sandflies and of the role of *Phlebotomus* in the transmission of disease. Taxonomic citations are provided for each species and subspecies, and an annotated distribution list referring to a map. For some species further notes are given, including references to transmission of disease. It is suggested that 'leg ratio' is worth recording as a measure of leg length in a readily comparable form, and that it provides additional information about certain genera, subgenera, species and infraspecific forms. Evolutionary hypotheses are put forward to explain features of the present distribution of Phlebotominae and leishmaniasis.

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Introduction

General

Phlebotomus Rondani & Berté is one of the two Old World genera of Phlebotominae and includes all the habitual mammal-biters and the vectors of human leishmaniasis in the Old World. Disease of this group have recently increased in several countries and epidemics have followed interruption of malaria control, so that renewed concern about the diseases and new research programmes demand up to date information about the vectors. During the past 80 years intensive study has yielded many widely scattered publications about *Phlebotomus*, particularly from leishmaniasis areas (Anonymous, 1977), and reviews of the genus in three zoogeographical regions have been published. Many species occur in all three of them (Lewis, 1978*b*: 311), and a general survey is required. The present work deals with some basic aspects of *Phlebotomus* throughout the Old World.

The classification of *Phlebotomus* and the Phlebotominae has been discussed by Abonnenc (1972), Fairchild (1955), Lewis *et al.* (1977), Theodor (1948; 1958) and others. I recognize the division of the living Phlebotominae into five genera, *Phlebotomus* and *Sergentomyia* França & Parrot in the Old World and *Warileya* Hertig (Fairchild, 1955: 183; Lewis *et al.*, 1977: 325), *Brumptomyia* França & Parrot and *Lutzomyia* França in the New World. Ready *et al.* (1980) have stressed the undoubted importance of subgenus *Psychodopygus* Mangabeira of *Lutzomyia* and treated it as a genus. Lewis *et al.* (1977: 324) gave reasons against such a course which would involve the elevation to generic rank of several, much more distinctive, Old World subgenera of sandflies and could lead to a general multiplication of genera. Such questions are among the 'pitfalls of perfection' (Nelson, 1978) and are 'handicaps of the human need to compress into linear form the three dimensional world of nature' (Campbell, 1974: 15). Taking a world-wide perspective, I regard *Psychodopygus* as an important subgenus without changing its rank.

Publications (most with keys) dealing with *Phlebotomus* in various areas include the following.

The Old World: Artemiev (1979: 19, *Euphlebotomus*; 1980, *Adlerius*), Lewis (1973), Theodor (1948).

The Palaearctic Region: Artemiev (1978, key with figures for Afghanistan), Croset (1978: 713, key with figures for Tunisia), Lewis & Büttiker, 1981, Saudi Arabia), Nadim & Javadian (1976, Iran), Perfil'ev (1968, key with figures for the U.S.S.R.), Theodor (1958, key and figures for the region).

The Afrotropical Region: Abonnenc (1972, key with figures), Quate (1964, Sudan).

The Oriental Region: Lewis (1978*b*).

The Australian Region: papers by Lewis and Dyce are being completed.

The taxonomic characters are easily seen in flies mounted in gum-chloral medium which may be ringed with Glyceel (Kevan, 1955: 417, 418; Southey, 1970: 51, 53, 56; Tribe, 1972). Potash was hardly ever used for maceration because it weakens intersegmental membranes and makes specimens difficult to remount. It was occasionally used for treating the tip of the abdomen to clarify the spermathecae although it may distort the ducts.

The characters used are described by Abonnenc (1972), Artemiev (1978: 1–8), Forattini (1973), Lewis (1973; 1978*b*: 219), Perfil'ev (1968), Theodor (1958), Young (1979: 5–8) and many others. Lewis's (1973) account is being amplified to include recently introduced characters, some of which are mentioned below.

Head length may be measured from the tip of the clypeus to the most posterior parts of the head, and eye length to include the fore and hind facets. The inter-ocular suture is of some use, but mainly for American species. The inter-arcal area lies between the cibarial chitinous arch and the cibarial teeth. The labrum is measured to include the anterior sensilla. The antennal papillae (Parrot, 1953) were discussed by Wirth & Navai (1978: fig. 5, 47). The dental depth is the distance from the tip of the maxilla to the most proximal tooth.

The relative lengths of various leg segments have been used for classification in several groups of insects, including Lepidoptera (Imms, 1964: 555, 556), aphids (Eastop, 1972: 173), Culicidae (Reid, 1953: 75), Ceratopogonidae (Wirth *et al.*, 1977: 621), Chironomidae (Pinder, 1978: 11, 19; Saether, 1976), Mycetophilidae (Hutson & Kidd, 1975: 29; Hutson *et al.*, 1980: 42), Cecidomyiidae (Panelius, 1965: 5, 132), and Phoridae (Borgmeier, 1964; Schmitz, 1957: 431, couplet 8;

1958). For the Phlebotominae, França (1919: 125) pointed out that leg-segment lengths of each of the species then known varied within narrow limits, and since then many authors have recorded the actual lengths of several or a few segments, mainly in species of *Lutzomyia.* French writers have measured the hind leg of many species. Raynal (1934: 350) indicated the value of the hind tibia-femur ratio for separating two species of *Phlebotomus*, and Zariquiey (1937: 417) used the lengths of basitarsus 1 (longer or shorter than femur 1) and of all tibiae of certain species of *Phlebotomus.* Theodor (1958: 4) remarked that the legs were particularly short in Palaearctic *Sergentomyia*, Artemiev (1978: 4) referred to various measurements of the hind leg, and Young (1979: 7) mentioned tibia length in *Lutzomyia.* L. W. Quate often recorded leg measurements regardless of sex, implying that the sexes are similar in this respect, and other publications indicate that differences are usually small.

In recent years some authors have recorded lengths of leg segments but not always the same ones, some have ceased to make such records, and others have never done so. It is now time to appraise the value of leg characters and of the time spent in measuring them. In the present work, therefore, the lengths of the long segments of each leg, of females when possible, are recorded in a way to allow quick comparison of species. The legs were measured at × 60, with occasional use of × 120 to locate extensions into preceding segments, which were included. Legs detached from the body could usually be recognized as first, second or third because tibia 2 is nearly always longer than 1, and 3 than 2. All lengths are expressed in units of which 100 are the length of femur 1 of a particular species, and the relative lengths of the nine long segments of one side, usually of one fly, are followed by the actual length in mm of femur 1, and of the wing in some cases. Leg diagrams, first drawn on the scale of one unit to one centimetre (examples in Figs 15–24) are useful for comparing species and picking out features of individual species for additional measurements.

The aedeagus comprises two side pieces fused at the base (Perfil'ev, 1968: 32, 42) and protects the tips of the sperm tubes. According to Theodor (1958: 5) these tubes are the true aedeagus, and the 'aedeagus' strictly speaking is the aedeagus sheath. Some authors have recorded the length of the aedeagus but without indicating the basal point from which it was measured. The most convenient point is usually the dorsal hind end near the bases of the coxites, and if other points are used in certain cases they can be indicated.

The last abdominal segment or proctiger of male sandflies is the ninth (Just, 1973: 314, 315, 316, 332) and shows some specific differences. Isaev (1935: 98) noted three types, in *P. papatasi*, in *P. sergenti* and a species of *Sergentomyia*, and in *P. chinensis*, characterized by the length of the surstyles, the nature of their junction to the segment, and the ventral shape of the latter. Appreciable differences are shown by the six species illustrated in Figs 8 to 14. Surstyle is a convenient name for the lateral lobes of the ninth tergite.

Keys to the subgenera and their species are provided and should be used in conjunction with descriptions. Taxonomic citations serve as a guide to literature on the genus, subgenera, species and subspecies. Distribution lists of all species show the sources of information for the maps. References to disease transmission by known or possible vector species show many which are or may be important, and indicate publications on biology as well as disease.

For some species full lists of taxonomic citations would be unduly complex and long, and early references are confined to a few of historic interest.

Where the original or later depository of a holotype, syntypes or other type-material is not shown by a describer, later author or other source, it is deduced (with a query) either from the original paper or another publication which is indicated. Some syntypes have been located with the aid of Abonnenc (1972) although he refers to them as holotypes. Information about the depositories of some types from Afghanistan is given by Artemiev (1978: 23). Types of species described by Professor O. Theodor were kept in the Hadassah Hebrew University Medical School, Jerusalem, until the collection was purchased from the University by the British Museum (Natural History) in 1981.

Distribution data, on which the maps are based, are of three kinds, viz. information about types, publications which give detailed information and often earlier references, and previously unpublished records indicated by collectors' initials or 'BMNH'.

Some Chinese records were not available when this work was being prepared, and are being assembled for publication by Professor Leng Y.-j. They include the description of '*P. major wui*', for which a preliminary note is included below under *P. major*, and records of *P. longiductus* from Xinjiang (Wu *et al.*, 1979).

Fossil Phlebotominae

It is appropriate to consider the fossils of Phlebotominae and their ancestors because they help to explain the relation of *Phlebotomus* to other genera and to the evolution of leishmaniasis. *Leishmania* probably arose from a monoxenic flagellate parasite of the ancestors of sandflies, so there is likely to be a phylogenetic relationship between the leishmaniae and their vectors (Saf'yanova, 1977*b*: 281).

The hopping flight of sandflies doubtless caused many to be trapped in resin, and some excellent fossil specimens have survived in several of the sources of insects in amber (Hennig, 1973: 6). Their approximate ages in MYA (millions of years ago) quoted below were supplied by Dr P. E. S. Whalley or taken from the British Museum (Natural History) (1972) time scale, Riek (1970) or the work of Smith & Briden (1977) which was also consulted for continental movements. Wings of the following species are illustrated (Figs 20–33) to give an impression of the groups mentioned here and later: *Permotipula patricia* Tillyard, 1929: 779 (Rohdendorf, 1974: 6), *Phlebotomites brevifilis* Hennig, 1972: 40, 62, *Phlebotomus tipuliformis* Meunier (Fig. 27 after Hennig), *Warileya nigrosacculus* Fairchild & Hertig, *P.* (*Spelaeophlebotomus*) *minteri*, *P.* (*Idiophlebotomus*) *frondifer*, *Lutzomyia paterna* (Quate, 1963), *Brumptomyia galindoi* (Fairchild & Hertig), *P.* (*Paraphlebotomus*) *sergenti*, *Lu.* (*Dampfomyia*) *permira* (Fairchild & Hertig), *Sergentomyia* (*Neophlebotomus*) *gombaki* (Lewis & Wharton), *S.* (*Sergentomyia*) *bedfordi* (Newstead), *S.* (*Sergentomyia*) *fallax* (Parrot) and *S.* (*Parvidens*) *lesleyae* (Lewis & Kirk).

370 MYA, Devonian

The earliest known insect, a wingless form, was living about this time (Riek, 1970: 168).

230 MYA, Upper Permian

The mecopteran *Permotipula* exemplifies a primitive wing to which that of *Nemopalpus* Macquart, though unrelated (Rohdendorf, 1974: 6), is remarkably similar. *Nemopalpus* is probably among the most primitive living Diptera, close to the basic stock of the Psychodidae and to the Phlebotominae in the matter of venation (Fairchild, 1955: 182; Lewis *et al.*, 1977: 323).

The original Diptera, present at this period, were probably biting flies feeding on insects or vertebrates and contemporaneous with the beginning of the reptile age, when the theromorph ancestors of mammals existed before the origin of birds (Downes, 1971: 241, 261, 262).

220 MYA, Lower Triassic

The infraorder Dictyodipteromorpha of the dipterous suborder Archidiptera was probably in existence; it flourished in the Upper Triassic and was apparently the ancestral group which gave rise to two branches, the infraorder Tipulimorpha Rohdendorf and all other later Diptera (Rohdendorf, 1974: 27, 55, 129, 136, 289, 329).

160 MYA, Middle Jurassic

The Tipulimorpha were established (Rohdendorf, 1974: 3, 291, 292) and included the tipulid family Tanydophryneidae Rohdendorf which appears to have been ancestral to 'superfamily' Psychodidea [fossil Psychodidae] (Rohdendorf, 1974: 3, 53, 219, 228, 291–293). This ancient group, distinguished from all other Tipulimorpha by primitive larval features, has retained a complex wing venation but its members have become smaller and thus been able to colonize microhabitats (Rohdendorf, 1974: 53, 58, 292). Before the end of the Jurassic the ancient group of the Phlebotominae, among the smallest of Diptera, must have come into existence (Hennig, 1972: 38, 55, 58), in which the origin of R_{2+3} has been displaced towards the wing tip so that the vein seems to come from R_4, and R_2 has been reduced (Hennig, 1969: 385). R_{2+3} is usually branched only in the most primitive Diptera (Colless & McAlpine, 1970: 664). Hennig's important 1972 paper was probably based largely on previous work unpublished owing to the second world war (Schlee, 1978: 382).

120 MYA, Lower Cretaceous

The first known two species of Phlebotominae existed in what is now the Lebanon and was south of the Tethys Sea (Hennig, 1972: 38; Melville, 1967: 293). The small, evidently primitive *Phlebotomites longifilis* Hennig, 1972: 40, 62, and *Phlebotomites brevifilis* Hennig, 1972: 40, 62 (Stuckenberg, 1975: 459), had wings with a broad distal half and broadly rounded tip which may have accounted for a displacement of the origin of R_{2+3} beyond that of R_5 (Hennig, 1972: 8, 27, 39, 43, 51). Although these species show few very striking differences from some recent forms they were included in a new genus because close relationship to *Phlebotomus* was not indicated. Hennig (1972: 21, 28) considered that they might belong to the ancestral group of the Phlebotominae or to his probably monophyletic 'Phlebotominae *s. str.*' which comprises *Phlebotomus, Sergentomyia, Brumptomyia* and *Lutzomyia.* Stuckenberg drew attention to the short palpal segment 5 of *Phlebotomites brevifilis* which is like that of some American sandflies. The two Cretaceous species and the present-day Neotropical *Warileya* have a similar type of wing structure and may be the sole remnants of an early movement from Africa to South America or vice versa across a south Atlantic connection in the Lower Cretaceous or earlier (Hennig, 1972: 38, 39, 44).

30 MYA, probably Upper Eocene

One poorly described species is known from Baltic amber (Rohdendorf, 1974: 275), *P.* (*Phlebotomiella*) *tipuliformis* Meunier, 1905*b* [as *P. tipuliformis*]; 1906: 103 [as *Phlebotomiella tipuliformis*]; 1912: 71 [as *P.* (*Phlebotomiella*) *tipuliformis*] (Fairchild, 1955: 183–187; Hennig, 1972: 51–55; Stuckenberg, 1975) and may have lived in the amber forest and fed on thin-skinned reptiles (Larsson, 1978: 92, 93). Hennig regarded it as a member of his Phlebotominae *s. str.* and perhaps of genus *Phlebotomus* and of subgenus *Euphlebotomus* or *Anaphlebotomus,* which showed that splitting of the ancient Phlebotominae was already far advanced. Stuckenberg referred to the short palpal segment 5 and primitive wing of *P. tipuliformis* and considered it to be congeneric with *Phlebotomites* and somewhat intermediate between it and 'Phlebotominae *s. str.*'.

26 MYA, Miocene

Lu. paterna (Quate, 1963: 114) (Hennig, 1972: 56, 59, 62, fig. 41) is the first known phlebotomine with a narrow wing and is related to living reptile-feeding species.

One MYA to the present day

Philaematus pungens Loew, 1845: 8 (Parrot, 1951: 28; Duckhouse & Lewis, 1980: 99) from copal of unknown origin, '*Phlebotomus pungens*' Meunier, 1905*a*: 209 (Duckhouse & Lewis, 1980: 99) from Zanzibar copal, and *S. succini* (Stuckenberg, 1975: 456) (Lewis *et al.*, 1977: 326; Duckhouse & Lewis, 1980: 105) from copal, possibly East African, may be less than one MYA and represent living species of *Sergentomyia.* Several specimens from African copal examined proved to belong to this genus, and one, treated with xylol and mounted in Euparal, clearly shows pharyngeal teeth, antennal ascoids and palpal sensilla.

Distribution

Quate (1962: 169, 170) regarded the Phlebotominae as tropical with northern intrusions. Sandflies occupy most of the Old World other than cold regions and oceanic islands, and they are absent from the Seychelles (Scott, 1933: 369), and *Phlebotomus* from Madagascar (Brygoo, 1974). Sandflies are considered to need at least 50 days a year with a temperature not less than 20°C (Perfil'ev, 1968: 98). Map 1, showing the general distribution of the subfamily in the Old World, is based on data cited by Lewis (1974) and Léger & Rodhain (1978). In western Europe *P. perniciosus* and *P. mascittii* occur about as far north as 49°N, and in Asia *P. chinensis* is the most northerly species (Perfil'ev, 1968: 89), reaching about 48°N (Beklemishev & Dolmatova, 1948: 354). In Canada sandflies are known from about 50°39′N near Kamloops, from 49°39′N at Coulee Creek in Alberta, and at 44°41′N near Ottawa. The southern boundary of sandflies in the Old and New Worlds is about 40°S (Perfil'ev, 1968: 90). The maps illustrate a mainly northern distribution of *Phlebotomus,* which is discussed later. It is exemplified by the northern distribution of *Larroussius,* and therefore of kala-azar, in Tunisia (Croset *et al.*, 1978: 744), and by the presence of five *Phlebotomus* species out of six Phlebotominae in France, and two out of 26 in Zaire (Vattier & Bimangou, 1974: 92; Vattier & Trouillet, 1975: 2; 1978: 701). Some 35 species, including *P. orientalis*, have marked eastern or western limits.

Biology

Numerous publications dealing with this extensive subject may be located by reference to Abonnenc (1972), Lewis (1973; 1974*a*; 1977; 1978*a*; 1978*b*), Perfil'ev (1968) and others, and notes on various species in the present work. The following brief note refers to a few aspects.

Sandfly larvae are difficult to find and many live in soil or burrows of animals. Development from egg to adult takes weeks or months according to temperature, and larvae undergo diapause in some northern and other areas. Many adults of both sexes feed on sugar and the females take vertebrate blood. Adults are active at night and rest in various shelters by day. Movement varies from short hops to flights of a few hundred metres and occasionally nearly 2 km, and is usually stopped by moderate wind. Palaearctic species tend to have one or two generations a year, and some tropical ones flourish in either the dry or the wet season.

The genus *Phlebotomus* includes all the habitual mammal-biters and therefore all the sandfly vectors of human disease in the Old World.

Relation to disease

The following summary of relation to disease in the Old World is supplemented by notes on some species. The leishmaniases are the main group of sandfly-borne vertebrate infections. It seems probable that *Leishmania* Ross, 1903; Wenyon, 1926: 396, having arisen as an insect parasite, came to infect reptiles and eventually mammals (Lewis, 1978*a*: 94; Telford, 1979: 322; Wilson & Southgate, 1979: 243), so that sandflies may be regarded as the primary hosts (Lainson & Shaw, 1979: 2). This phylogenetic priority is not only of historical interest for it is reflected in present-day associations which have a practical significance. Lizard leishmanias now occurs in the Old World and possibly in the New World (Lainson & Shaw, 1979: 34). No *Leishmania* is known in birds (Adler, 1964: 42).

Many forms of *Leishmania* are transmitted among mammals by species of *Phlebotomus*. Basically, each causes a zoonosis into which man may enter to a varying extent, so that human involvement ranges from sporadic cases to a purely man-sandfly infection. Probably in Asia leishmaniae caused enzootics in canids and rodents which led to certain anthroponotic forms which spread to some other Palaearctic areas (Garnham, 1971: 482, 488; 1977: 18; Hoogstraal & Heyneman, 1969: 1185; Lysenko, 1971: 515–518).

The forms of *Leishmania* are now being classified by means of objective biochemical, serological and other studies of their intrinsic characters (Chance, 1979; Chance *et al.*, 1977; Garnham, 1976: 536; Lumsden, 1977: 47; de Raadt, 1977: 314; Taqi & Evans, 1978: 56; Williams & Coelho, 1978; Zuckerman & Lainson, 1977: 89), and many forms will probably be recognized.

For a long time the leishmaniae were grouped, according to their normal (Lainson & Shaw, 1971: 21) effect on the (secondary) human host, into visceral leishmaniasis (VL) or kala-azar and cutaneous or dermal leishmaniasis (CL) which causes oriental sore and other diseases. This grouping is unsatisfactory (Chance *et al.*, 1977: 53, 56) but, despite rapidly changing concepts, is still of some practical value. It is used here, where the taxonomic names of the parasites are taken mainly from Lumsden (1977*a*: 46, 49; 1977*b*).

VL is caused by forms of the *Le. donovani* (Laveran & Mesnil, 1903*a*; 1903*b*: 958) complex which occur largely in wild Canidae and are transmitted mainly by species of the subgenera *Larroussius* and *Adlerius*. The anthroponotic leishmaniasis of eastern India is due to *Le. d. donovani* which has no dog or other animal reservoir and is transmitted by a species of *Euphlebotomus*. *Le. d. infantum* Nicole, 1908, probably spread from Asia via Transcaucasia into the Mediterranean area where it attacks dogs and children rather than adults. VL probably spread eastwards via the Gobi Desert to eastern China (Beklemishev & Dolmatova, 1948: 351). The east African VL is transmitted by a species of *Synphlebotomus*, and may infect animals as secondary hosts (Lysenko, 1971: 518).

CL is due largely to members of the *Le. tropica* (Wright, 1903) group. The wild hosts, if any, are usually rodents, and most of the sandfly vectors belong to the subgenera *Phlebotomus* and

Paraphlebotomus. *Le. t. major* Yakimov: 1915: 501; Zuckerman & Lainson, 1977: 67 occurs largely in central Asia (Lysenko, 1971: 518; Lysenko & Belaev, 1977: 250, map) where it infects *Rhombomys opimus* Lichtenstein, 1823, and some other rodents, and causes 'moist sore' in man. *Le. t. tropica* (= *minor* Yakimov) was possibly derived (Hoogstraal & Heyneman, 1969: 1184) from *Le. t. major*, occurs from the Mediterranean area to India (Lysenko, 1971: 58), is largely urban, causes 'dry sore' in man and infects dogs. *Le. aethiopica* Bray, Ashford & Bray is a hyrax parasite which causes disseminated CL in Ethiopia and is transmitted by a species of *Larroussius*.

VL and CL usually occur in different areas (Lysenko, 1971: 518, 519; Lysenko & Beliaev, 1977: 250; Theodor, 1964: 487), largely owing to the distribution of their vectors.

The recognition of a vector is a complex process involving many subjects which include sandfly taxonomy, distribution, host choice and other aspects of ecology, determination of flagellates found in wild flies, development of leishmaniae ingested by flies in the laboratory, and experimental transmission. Proof that a species is a vector can seldom be obtained, and it applies only to a particular place and time; de Raadt (1977: 314) pointed out that detailed study of epidemiology only gives an instantaneous reflection of a process continuing over a long period. The significance of a vector may alter (Lysenko & Beliaev, 1977*b*: 263; Sergiev, 1977: 283). There are many gradations from occasional to habitual minor and major vectors. It is therefore impossible to draw up a simple list of vectors, but a list of vectors and suspected vectors is of some value, especially if followed by a summary of the evidence related to each species. In the present work this is confined to references to the literature.

Killick-Kendrick (1978: 299, 300) listed 52 taxa, 28 of them Old World form, of *Phlebotomus*, known or suspected of being vectors of leishmaniasis. The Old World taxa, listed in relation to types of the disease in man are: visceral (*Synphlebotomus*) *celiae*, *martini*, *vansomerenae*, (*Larroussius*) *ariasi*, *kandelakii kandelakii*, *longicuspis*, *major* s. l., *orientalis*, *perniciosus perniciosus*, *tobbi*, (*Adlerius*) *chinensis chinensis*, *ch. halepensis*, *longiductus*, *simici*, (*Euphlebotomus*) *argentipes*; cutaneous (with four marked '+ VL?' which may transmit kala-azar locally): *P.* (*Phlebotomus*) *bergeroti*, *duboscqi*, *papatasi* (+ VL?), *salehi*, (*Paraphlebotomus*) *alexandri*, *caucasicus* (+ VL?), *chabaudi*, *mongolensis* (+ VL?), *sergenti sergenti*, (*Synphlebotomus*) *ansarii*, (*Larroussius*) *longipes*, *pedifer*, *perfiliewi* (+ VL?). *P. rossi* is a recent suspect.

In addition to known vectors some sandflies presumably transmit VL among animals in large areas of Africa where the human disease occurs but is rare (Gigade, 1978: 239), and in part of the Sudan (Hoogstraal & Heyneman, 1969: 1141) and elsewhere where the infection is present with no apparent vector.

Many apsects of vectors have been discussed by Adler (1964: 48, 80), Bray (1974: 91), Hoogstraal & Heyneman (1969), Killick-Kendrick (1978; 1979), Lewis (1971; 1974; 1978*a*), Minter (1972), Molyneux (1977: 43–53), Saf'yanova (1967), Sergiev (1967: 26; 1979) and Williams & Coelho (1978).

Sandfly fever virus, transmitted by *P. papatasi* and possibly other species (Perfil'ev, 1968: 128), occurs mainly in the Mediterranean area.

Most vector species are difficult, and some impossible, to control. Domestic species were largely controlled by house-spraying against malaria vectors but have increased where this has been stopped, in India, for instance, and in Greece where VL and CL increased when mosquito-spraying ceased (Léger *et al.*, 1979: 12). Sandflies have shown little resistance to insecticides (Killick-Kendrick, 1978: 304) till recent instances in India.

Explanation of terms

Various

Antenna 3 etc.	Antennal segment 3 etc.
Chahar Mahal	Part of Bakhtiar va Chahar Mahal Province, Iran
Chinese, romanization of spelling	The Pinyin system, adopted in the 1980 edition of *The Times Atlas*, is used here
CL	Cutaneous leishmaniasis
Gamma	The distance between the origin of wing-veins R_{2+3} and R_4 and the origin of R_5

Gruziya	Georgian S.S.S.R. (Georgia)
ICZN	*International Code of Zoological Nomenclature* (1964) and Amendments (1973)
Inverted commas	Places in distribution lists not located
Kosovo i Metohija	Present name for Kosmet, Yugoslavia
Le.	*Leishmania*
Leg segments	100 units = length of femur 1
Lu.	*Lutzomyia*
Map symbol underlined	Locality approximate
MYA	Millions of years ago
P.	*Phlebotomus*
Palp 3 etc.	Palp segment 3 etc.
R_2 etc.	Radius branch 2 and other wing veins
S.	*Sergentomyia*
Sperm pump and tubes	Genital pump and filaments
Transcaucasia	Historic name for U.S.S.R. area south of Caucasus (now Armenia, Azerbaydzhan and Gruziya)
VL	Visceral leishmaniasis
WL	Wing length in mm

Names of collectors mentioned

A. E. E.	A. E. Eaton
C. A. V. B.	C. A. V. Barkhuus
D. J. L.	D. J. Lewis
D. M. A.	D. M. Ackland
D. M. M.	D. M. Minter
E. K. S.	E. K. Saliba
E. M.	Unknown
G. B. W.	G. B. White
G. S.	G. Shidrawi
H. C. B.	H. C. Barnett
H. W. L.	H. W. Leathem
J. A. S.	J. A. Sinton
J. O. C.	J. Omer-Cooper
J. P. M.	J. P. McMahon
J. P. T. B.	J. P. T. Boorman
J. P. D.	J.-P. Dedet
J. W.	J. Waterston
J. Wn.	Jane Wilson
K. B.	K. Behbehani
K. K.	K. Kertész
K. Z. D.	K. Zein el Dine
L. E. S.	L. E. Stephen
L. Y.-j.	Leng Yan-jia
M. A.	M. Ashraf
M. A. R.	M. A. Rifa'at
N. L. C.	N. L. Corkill
P. A. B.	P. A. Buxton
P.	Petrie
R. A. B.	R. A. Bolt
R. E. D. B.	R. E. Drake Brockman
R. L. C.	R. L. Coe
R. P. L.	R. P. Lane
R. W. A.	R. W. Ashford
S. A.	S. Adler
S. A. S.	S. A. Smith
S. J. R.	S. J. Rahman
S. T.	S. Taussig
V. D.	V. Dhanda
Y. S.	Y. Schlein

Depositories, actual, probable or original

ANIC, Canberra	Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra.
BMNH	British Museum (Natural History)
BPBM, Honolulu	Bernice P. Bishop Museum, Honolulu
CA, Los Baños	College of Agriculture, Los Baños, Philippines
CFHS, Nanking	Central Field Health Station, Nanking
CIH, Sydney	Commonwealth Institute of Health, Sydney, Australia (till 1980 School of Public Health and Tropical Medicine)
CRI, Kasauli	Central Research Institute, Kasauli
EM, Montpellier	Laboratoire d'Ecologie, Université de Montpellier, France
FM, Paris	Laboratoire de Parasitologie, Faculté de Médicine, Paris
IH, Scoplje	Institute of Hygiene, Skoplje, Yugoslavia
IP, Algiers	Institut Pasteur, Algiers
IP, Paris	Institut Pasteur, Paris
IPH, Tehran	School of Public Health and Institute of Public Health, Tehran
L, Bastia	Lycée, Bastia, Corsica
LSHTM, London	London School of Hygiene and Tropical Medicine, London
NM, Vienna	Naturhistorisches Museum, Vienna
MB, Corales	Musée Bocage, Colares, Portugal
MC, Kweiyang	Medical College, Kweiyang, China
MH, Sinferopol	Military Hospital, Sinferopol, U.S.S.R.
MI, Moscow	Institute of Tropical Medicine and Parasitology, Moscow [Location of some holotypes mentioned by Artemiev, 1978: 23.]
MRAC, Tervuren	Musée Royal de l'Afrique Centrale, Tervuren, Belgium
NM, Nairobi	National Museum of Kenya, Nairobi
PIPD, Shantung	Provincial Institute of Parasitic Diseases, Shandong
SAIMR, Johannesburg	South African Institute of Medical Research, Johannesburg, South Africa
TI, Dushanbe	Tropical Institute of Tadzhiskaya S.S.S.R., Dushanbe
TI, Tbilisi	Tropical Institute, Tbilisi
TM	T. Maa's collection
U, Moscow	University, Moscow
U, Pavia	University of Pavia, Italy
U, Vienna	University, Vienna
US, Tashkent	Protozoology Division, Uzbekistan Sanitary and Biological Institute, Tashkent
ZSI, Calcutta	Zoological Survey of India, Calcutta
ZI, Leningrad	Zoological Institute, Academy of Sciences of the U.S.S.R., Leningrad

Keys, citations, distribution and notes

Genus *PHLEBOTOMUS* Rondani & Berté

Flebotomus Rondani & Berté in Rondani, 1840: 12. Type-species: *Bibio papatasi* Scopoli, by monotypy.
Phlebotomus Rondani & Berté; Loew, 1845: 9 [emendation; first use of this name and Phlebotomidae mentioned by Lewis *in* Lewis *et al.*, 1977: 321 incorrect; spelling fixed under suspension of rules by ICZN, 1954, Opinion 256: 199]; Summers, 1911; Theodor, 1948: 96; 1958: 316; 1965: 179; Fairchild, 1955: 188; Quate, 1964: 237, 238; Lewis, 1967: 14; 1973: 162; 1978*b*: 233; Perfil'ev, 1968: 218; Abonnenc, 1972: 75, 92; Lewis, Young, Fairchild & Minter, 1977: 321, 326; Abonnenc & Léger, 1977: 71, 76; Duckhouse & Lewis, 1980: 99.

Cibarium of female usually without a row of teeth but often having a group of spicules, pigment patch usually absent. Antenna 3 usually long, three or more segments of male with two ascoids. Mesanepisternum usually with a few antero-ventrad hairs (Abonnenc & Léger, 1977: 71, 72). Abdominal tergites 2–6 with many erect hairs. Spermathecae usually segmented. Style with three to five spines, only one or two terminal. Paramere often complex. Species often large and pale.

There are a few omissions from the keys because only the female is described for *P. sejunctus*, *teshi*, *tubifer* (male found), *pexopharynx*, *betisi* and *somaliensis*, and only the male for *P. buccina-*

tor, *papuensis*, *trifilis*, *katangensis*, *fantalensis*, *chadlii*, *langeroni*, *mariae*, *perfiliewi galilaeus*, *comatus* (female found) and *caudatus*, and because species A, B, C and D are not yet described, the females of *P. brevis brevis*, *P. chinensis halepensis* and *P. ch. kyreniae* and the male of the latter are not sufficiently described, and the descriptions of '*P. major wui*' and *P.* (*Eu.*) *autumnalis* Artemiev were not available in time. Suitable descriptions of the missing forms could lead to improved keys.

Key to the subgenera of *Phlebotomus*

1 Distance between bases of R_4 and R_5 relatively short, not more than a quarter of width of wing. A pair of rods present next to genital pump. Palpal sensilla not spatulate.
Antenna 3 very long and much longer than palp. Palp short, with segment 5 shorter than or equal to 3. Style very long. Spermathecal ducts usually short and wide 2

– Distance between bases of R_4 and R_5 relatively long, at least a third of width of wing. Genital pump without adjacent rods. Palpal sensilla spatulate 3

2 Vein M_{1+2} forking at level of radio-median cross-vein, before base of R_4. Cibarium of female unarmed. Antenna 3 = 2·3 to 2·5 times length of labrum. Palp segment 3 not enlarged at base, with sensilla scattered on flat surface. Style with four spines and a long hair. Afrotropical Region. . . . . Subgenus ***SPELAEOPHLEBOTOMUS*** (p. 131)

– Vein M_{1+2} forking beyond level of radio-median cross-vein, beyond base of R_4. Cibarium of female with teeth covering a large area. Antenna 3 about three or more times length of labrum. Palp segment 3 enlarged at base, with sunken patch of sensilla. Style with three to five thick spines and sometimes several thick hairs. Oriental, Palaearctic and Australian Regions
Subgenus ***IDIOPHLEBOTOMUS*** (p. 133)

3 Style with three spines.
Female with row of about five to ten cibarial teeth, few or no hypopharyngeal teeth, and thin-walled spermathecae. Male with genital filaments short or very short, paramere simple and beak-like, and coxite with simple hair pattern
Subgenus ***AUSTRALOPHLEBOTOMUS*** (p. 135)

– Style with four or more spines 4

4 Coxite with hairy process near base. Genital filaments short, 1·3 to 2·3 times length of pump . 5

– Coxite without such process. Genital filaments 3 to 11 times length of pump 7

5 Coxite 0·37 to 0·74 mm long, its process very small. Style long and cylindrical with three distal spatulate spines and two other spines. Paramere with two upward processes. Surstyle with distal spines. Pharyngeal armature of female comprising either a network of lines or scales. Spermatheca with nearly equal segments and a refractive membrane near the distal one
Subgenus ***PHLEBOTOMUS*** (p. 137)

– Coxite 0·20 to 0·33 mm long, its process usually large, and having a brush of long hairs. Style not long, with four or five spines. Paramere simple, distal upper surface flat and elliptical with short hairs. Surstyle without distal spines. Pharynx of female with teeth or scales. Spermatheca sometimes with differentiated rounded end-segment 6

6 Style with four long spines, two near the tip and two near the base. Pharynx of female with large backwardly directed teeth . . . . . . Subgenus ***PARAPHLEBOTOMUS*** (p. 142)

– Style with five long spines, two at the tip and three near the middle. Pharynx of female with irregular scales or punctiform teeth . . . . Subgenus ***SYNPHLEBOTOMUS*** (p. 148)

7 Style with four long spines, one distal, one subterminal, and two near middle.
Paramere with one or two extra lobes, with or without accessory spine. Aedeagus sometimes conical. Pharynx of female with a small group of teeth in middle, and behind it some concentric lines. Spermatheca segmented, end-segment not enlarged
Subgenus ***ANAPHLEBOTOMUS*** (p. 170)

– Style with five long spines 8

8 Paramere with one or two extra lobes, with or without accessory spine. Pharynx of female as in *Anaphlebotomus*.
Spermatheca with differentiated end-segment . . Subgenus ***EUPHLEBOTOMUS*** (p. 168)

– Paramere without extra lobes. Pharyngeal armature otherwise 9

9 Paramere truncated.
Antenna 3 and legs long, and wings narrow. Spermatheca moniliform. Haltere of male with broad stalk. Paramere with adjacent rod . . . . . Subgenus ***KASAULIUS*** (p. 172)

– Paramere not truncated 10

10 Pharynx of female and male with punctiform teeth (large in *wenyoni*), except in *mascittii* which has large irregular teeth. Spermatheca segmented, with long finger-like neck except in *somaliensis*, which has a rather long end-segment, and *mascittii*, which has a spermatheca with transverse striations often in distal part, a small head, little or no narrowing, and a wide duct. Genital filaments three to five times as long as pump . . Subgenus ***LARROUSSIUS*** (p. 150)

– Pharynx of female with triangular or rounded group of medium-size teeth. Spermatheca incompletely segmented. Genital filaments usually very long, 6·6 to 11·0 length of pump Subgenus ***ADLERIUS*** (p. 163)

Tibia 3 in certain species

The following records of relative lengths of tibia 3 (femur 1 = 100 units, females unless males indicated) are placed here for species about which no other taxonomic information is given.

P. aculeatus (Kenya) ♂, 182 (2·26 mm); *betisi*, 199; *gibiensis* ♂, 212 (2·30 mm); *guggisbergi*, 188; *kandelakii kandelakii*, 164; *longicuspis* (Algeria) ♂, 181; *major major* (Nepal), 193; *orientalis* (Yemen), 173; *pedifer* (Kenya), 177; *perfiliewi perfiliewi* (Italy), 177; *smirnovi* (U.S.S.R.) ♂, 147; *tobbi* (Greece), 179; *angustus* ♂, 189; *hindustanicus* (Pakistan) ♂, 202; *rupester* ♂, 163; *simici* (Yugoslavia) ♂, 164; *kiangsuensis* ♂, 185; *colabaensis*, 185; *rodhaini* (Sudan), 167; sp. D ♂, 189 (2·66 mm); *stantoni*, 176.

Subgenus ***SPELAEOPHLEBOTOMUS*** Theodor

Phlebotomus subgenus *Spelaeophlebotomus* Theodor, 1948: (94), 100, 108; Quate & Fairchild, 1961: 208; Lewis, 1973: 162; Lewis, Young, Fairchild & Minter, 1977: 325, 326. Type-species: *Phlebotomus gigas* Parrot & Schwetz, 1937, by original designation.

Spelaeophlebotomus Theodor; Abonnenc & Minter, 1965: 30; Vattier-Bernard, 1970: 189; Forattini, 1971: 97; Abonnenc, 1972: 88; Abonnenc & Léger, 1976: 76.

Theodor provisionally treated this taxon as a subgenus and Abonnenc & Minter raised it to generic rank on the strength of wing venation. After discussion with Professor Theodor (1972; 1974, in *litt.*). I consider that wing features of this group, and possibly the American *Warileya*, do not justify generic treatment. For this reason, and in the interests of stability (Lewis *et al.*, 1977), *Spelaeophlebotomus* is here treated as a subgenus.

Key to the species of subgenus *Spelaeophlebotomus*

1 Antenna 3 of female 2·3–2·5 length of labrum. Paramere of male with slight basal swelling ***gigas*** (p. 131)

– Antenna 3 of female 3·9 length of labrum. Paramere of male with long setiferous lobe . ***minteri*** (p. 131)

Phlebotomus (*Spelaeophlebotomus*) *gigas* Parrot & Schwetz

(Map 1)

Phlebotomus gigas Parrot & Schwetz, 1937: 224 [♀]; Parrot & Wanson, 1938: 153 [♂]; 1946: 143; Kirk & Lewis, 1946*b*: 119; 1948: 327; 1951: 438; Parrot, 1953: 114. Syntypes 4 ♀, Zaire (MRAC, Tervuren).

Phlebotomus (*Spelaeophlebotomus*) *gigas* Parrot & Schwetz; Theodor, 1948: 94, 108.

Spelaeophlebotomus gigas Parrot & Schwetz; Vattier-Bernard, 1970: 194; Abonnenc, 1972: 89.

Distribution. **Africa**: Abonnenc (1972: 261, map); Vattier-Bernard (1970: 194, 221, early stages, map).

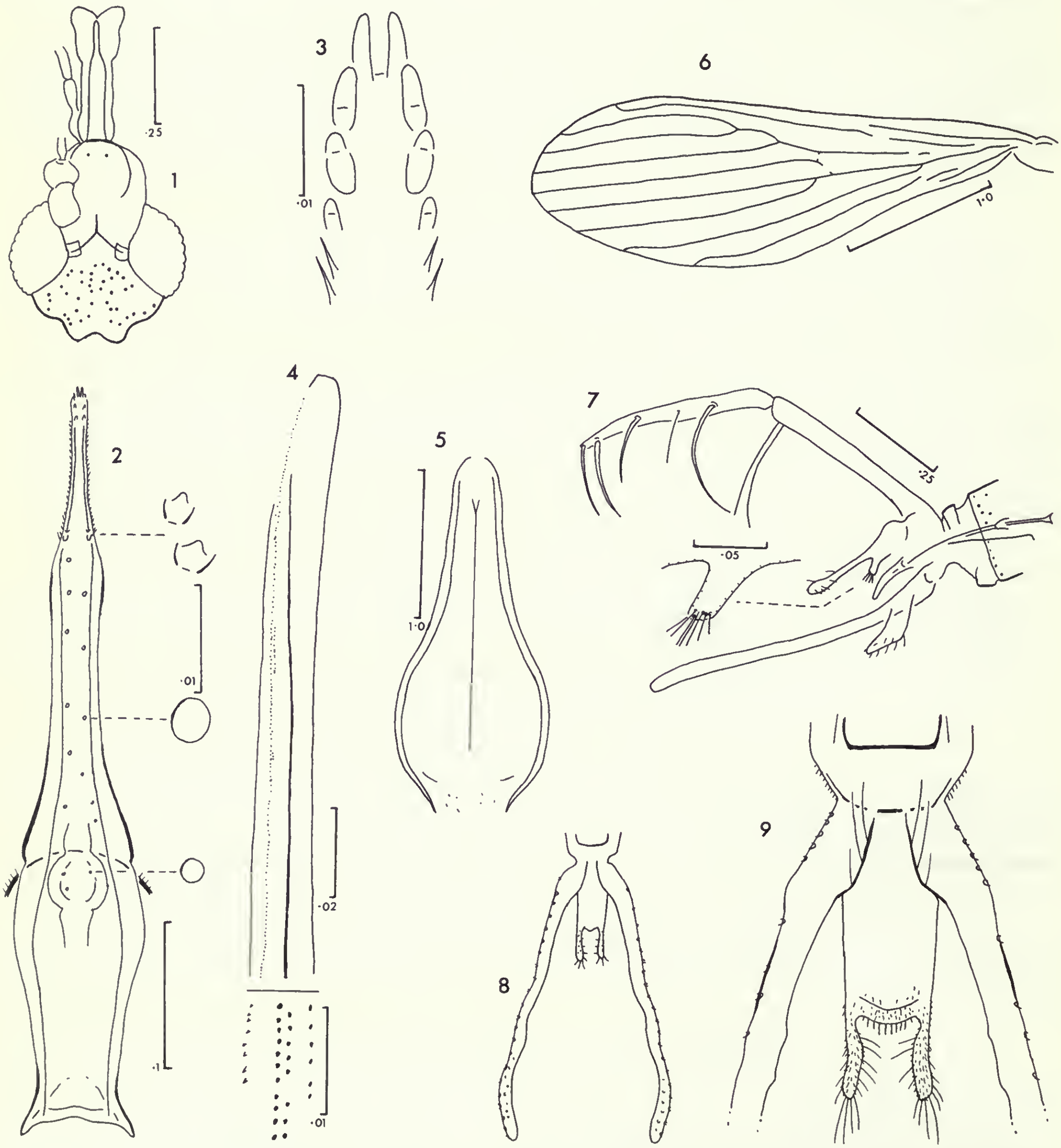
Note. *P. gigas* is a very large species which lives in caves and bites bats and other small animals and will attack man (Abonnenc, 1972: 90).

Phlebotomus (*Spelaeophlebotomus*) *minteri* sp. n.

(Figs 1–9, Map 1)

♀. Head 0·52 mm long, eye 0·45 of its length with more than 50 facets, interocular suture complete, clypeus with few hairs. Labrum 0·31 mm long, 0·61 length of head, 0·09 length of wing, with narrow apical part, subapical sensilla very close together, and few cibarial sensilla. Cibarium with no chitinous arch, teeth or pigment patch. Pharynx with marked subterminal bulge and scarcely visible spicules. Hypopharynx with about 50 teeth on each side. Antenna 3 = 1·22 mm long, 1·17 length of 4 + 5, 3·88 length of labrum, 0·35 length of wing, ascoids not clear but probably as in *P. gigas*, papillae not seen. Mandible pointed, with minute teeth. Maxilla with no lateral teeth, 50 or more ventrals, some of them in two rows, and a dental depth of 0·17 mm; palpal formula 10, 20, 42, 20, 41; eight mesad sensilla on segment 3. Scutum and pleuron pale, prosternal lobes short, mesanepisternum without hairs. Leg formula 100, 184, 201; 86, 195, 181; 97, 211, 198 (3·50, 1·59). Wing length 3·50 mm, 3·18 width, R_2/R_{2+3} 4·33, R_1 overlap/R_2 0·66, R_1 and R_2 markedly curved, venation as in *P. gigas*. Haltere long. Abdominal tergal hairs erect and rather evenly spread. Spermathecae invisible in specimen.

♂. Eye 0·45 length of head. Interocular suture complete. Labrum 0·20 (0·19–0·21) mm long, 0·07 (0·07–0·07) length of wing. Cibarium and pharynx virtually unarmed. Antenna 3 = 1·23 (1·17–1·29) mm long, 1·12



Figs 1–9 *Phlebotomus minteri.* (1) ♀, head; (2) ♀, labro-cibarium; (3) ♀, tip of labrum; (4) ♀, maxilla, with fore, middle and hind ventral teeth enlarged; (5) ♀, pharynx; (6) ♀, wing; (7) ♂, terminalia; (8, 9) ♂, abdominal segment 9.

(1·10–1·15) length of 4 + 5, 6·18 (6·09–6·25) length of labrum, 0·43 (0·43–0·44) length of wing. Ascoids unclear in balsam mounts. Wing length 2·85 (2·66–2·95) mm long, 3·45 times width, $R_2/_{2+3}$ 5·42 (4·35–6·10), R_1 overlap/R_2 0·71 (0·66–0·86). Aedeagus curving downward, with blunt end; filament 2·4 length of pump, with nearby pair of rods. Paramere with sub-basal hairy lobe, widening near tip. Coxite with two long ventral hairs near tip; style narrow with four spines and one seta. Segment 9 as figured.

MATERIAL EXAMINED

Holotype ♂, **Tanzania**: Amboni Cave, 5°04′S 39°02′E, 26.x.1957 (*D.M.M.*) (BMNH).

Paratypes. 1 ♀, 4 ♂, same data (all in BMNH except one ♂ in LSHTM, London).

COMMENTS. This species is named after Dr D. M. Minter in appreciation of his important work on sandflies and leishmaniasis. *P. minteri* differs from *P. gigas* chiefly in having a relatively longer labrum in both sexes and a pronounced parameral lobe in the male. The eyes are not very small. The maxillary dentition is remarkable, presumably suited to bat-feeding, and the partly double row of teeth may be unique to this subgenus.

The Amboni Cave has been described by Cooke (1970) and Peet (1957: 152). Dr Minter caught the sandflies on the wall of the cave, and informs me that about the same year four species of bats, *Tritaenops persicus afer* Peters, 1877, *Coleura afra* (Peters, 1852), *Tadarida* (*Chaerepha*) *pumila* (Cretzschmar, 1826) and *Miniopterus minor* (Peters, 1867) were caught in the caves by Mr Colley and identified by Dr D. L. Harrison.

Subgenus *IDIOPHLEBOTOMUS* Quate & Fairchild

Phlebotomus subgenus *Idiophlebotomus* Quate & Fairchild, 1961: 208; Theodor, 1965: 176; Lewis, 1973: 162; 1978: 250; Lewis & Lane, 1976: 53; Abonnenc & Léger, 1976: 76. Type-species: *Phlebotomus asperulus* Quate & Fairchild, 1961, by original designation.

The status of this subgenus is discussed with that of *Spelaeophlebotomus*. Most species live in caves and probably feed on bats.

Key to the species of subgenus *Idiophlebotomus*

Females

1 Cibarial armature with median rod or big tooth 2
– Cibarial armature without median rod or big tooth 7
2 Cibarial median rod with large serrations . . . . ***asperulus*** (p. 134)
– Cibarial median rod with minute serrations or none 3
3 Cibarium without patch of teeth except a few granulose spicules . . . . . ***erebicolus*** (p. 134)
– Cibarium with patch of teeth 4
4 Median cibarial projection short and tooth-shaped . . . . ***teshi*** (p. 135)
– Median cibarial projection long and rod-shaped 5
5 Cibarial teeth in radiating lines . . . . ***tubifer*** (p. 135)
– Cibarial teeth not in radiating lines 6
6 Cibarial teeth very long and parallel . . . . ***frondifer*** (p. 134)
– Cibarial teeth not very long and parallel . . . . ***pholetor*** (p. 134)
7 Pharynx with scale-like teeth . . . . ***longiforceps*** (p. 134)
– Pharynx unarmed 8
8 Cibarial teeth all small . . . . ***stellae*** (p. 135)
– Anterior cibarial teeth very long . . . . ***sejunctus*** (p. 135)

Males

1 Apical spine of style with marked basal expansion . . . . ***asperulus*** (p. 134)
– Apical spine of style without such expansion 2
2 Style with three spines 3
– Style with more than three spines 4
3 Coxite with the two non-distal spines at 0·39. Paramere nearly straight with bulbous apex ***erebicolus*** (p. 134)
– Coxite with the two non-distal spines at 0·5 or 0·6, and 0·7. Paramere curved upward and pointed ***longiforceps*** (p. 134)
4 Style with four spines . . . . ***frondifer*** (p. 134)

– Style with five spines 5
5 Aedeagus prominent and capitate. Paramere slender and without dorsal appendage . ***pholetor*** (p. 134)
– Aedeagus small and triangular. Paramere with basal dorsal curved appendage . . ***stellae*** (p. 135)

Phlebotomus (Idiophlebotomus) asperulus Quate & Fairchild

(Map 1)

Phlebotomus (*Idiophlebotomus*) *asperulus* Quate & Fairchild, 1961: 208 [♀ ♂]; Lewis & Lane, 1976: 54; Lewis, 1978*b*: 250. Holotype ♂, WEST MALAYSIA (BPBM, Honolulu).

DISTRIBUTION. **West Malaysia**: Lewis (1978*b*: 251, map).

Phlebotomus (Idiophlebotomus) erebicolus Quate

(Map 1)

Phlebotomus (*Idiophlebotomus*) *erebicolus* Quate, 1965: 22 [♀ ♂]; Lewis & Lane, 1976: 57; Lewis, 1978*b*: 251. Holotype ♂, PHILIPPINES (BPBM, Honolulu).

♀. Leg formula, after Quate, 10, 186, 108; 92, 186, 106; 103, 203, 106.

Phlebotomus (Idiophlebotomus) frondifer Lewis & Lane

(Map 1)

Phlebotomus (*Idiophlebotomus*) *frondifer* Lewis & Lane, 1976: 57 [♀ ♂]; Lewis, 1978*b*: 251; Holotype ♂, WEST MALAYSIA (BMNH) [examined].

♀ (*extra fact*). Leg formula 100, 149, 91; 99, 167, 93; 103, 216, 101 (2·16, 0·89).

Phlebotomus (Idiophlebotomus) longiforceps (Wang, Ku & Yuan)

(Map 1)

Sergentomyia longiforceps Wang, Ku & Yuan, 1974: 334 [♀ ♂]. Holotype ♂, CHINA: Rongjiang (Chung-Kiang Hsien) (MC, Guiyang).
Phlebotomus longiforceps (Wang, Ku & Yuan) Lewis, Young, Fairchild & Minter, 1977: 326.
Idiophlebotomus longiforceps (Wang, Ku & Yuan) Xiong *et al*., 1980: 322 [intra-abdominal rods].

The description is in Chinese with an English summary, and some features are as follows.

♀. Cibarium and pharynx figured. Cibarium with more than 60 small triangular teeth in rows and no pigment patch. Pharynx with many wedge-shaped teeth of different sizes, arranged irregularly. Antenna 3 = 0·526 mm long, 1·82 length of 4 + 5, 2·3 length of labrum, 0·61 length of wing width. Palp formula 1, 4, 2, 5, 3; relative lengths 1 : 2·5 : 4 : 2 : 3. Wing figured, length 2·618 mm, 3·0 width (0·861 mm), R_1 overlap = +0·406 mm, M_{1+2} fork 0·105 mm beyond origin of R_4. Abdominal tergites 2–6 with many erect hairs. Spermatheca figured, rather large, carrot-shaped and unsegmented with irregular wrinkles.

♂. Cibarium and pharynx figured. Antenna 3 = 0·714 mm long, 1·76 length of 4 + 5, 2·69 length of labrum, two ascoids on 3–15. Palp ratio 1, 4, 2, 5, 3, relative lengths 1 : 2·37 : 4·5 : 1·87 : 2·95. Wing figured, length 2·356 mm, 3·17 width (0·742 mm), R_1 overlap = +0·280 mm, M_{1+2} fork = +0·091 mm beyond origin of R_4. Terminalia as figured (but with intra-abdominal rods); paramere single, and claw-shaped coxite approximately 2·4 length of style, with long hairs on apical half; style with three spines, one of them apical.

Phlebotomus (Idiophlebotomus) pholetor Quate & Fairchild

(Map 1)

Phlebotomus (*Idiophlebotomus*) *pholetor* Quate & Fairchild, 1961: 210 [♀ ♂]; Lewis & Lane, 1976: 57; Lewis, 1978*b*: 251. Holotype ♂, BORNEO: Sabah (BPBM, Honolulu).

♀ (*extra fact*, Sabah, 12.xi.1972). Leg formula 100, 149, 90; 95, 159, 90; 121, 187, 100 (2·13, 0·88).

DISTRIBUTION. **Borneo (Sabah) and Philippines**: Lewis (1978*b*: 236, map).

Phlebotomus* (*Idiophlebotomus*) *sejunctus (Quate)

(Map 1)

Phlebotomus (*Idiophlebotomus*) *sejunctus* Quate, 1965: 22 [♀]; Lewis, 1978*b*: 251. Holotype ♀, PHILIPPINES (BPBM, Honolulu).

Phlebotomus* (*Idiophlebotomus*) *stellae Quate

(Map 1)

Phlebotomus (*Idiophlebotomus*) *stellae* Quate, 1965: 20 [♀ ♂]; Lewis & Lane, 1976: 59; Lewis, 1978*b*: 251. Holotype ♂, PHILIPPINES (BPBM, Honolulu).

♂. Leg formula after Quate, 100, 135, 88; 97, 157, 91; 104, 185, 101 (0·84).

Phlebotomus* (*Idiophlebotomus*) *teshi Lewis

(Map 1)

Phlebotomus (*Idiophlebotomus*) *teshi* Lewis, 1978*b*: 252 [♀]. Holotype ♀, NEPAL: Pokhara (BPBM, Honolulu).

♀. Leg formula 100, 120, 90; 92, 156, 83; 96, 182, 134.

Phlebotomus* (*Idiophlebotomus*) *tubifer Lewis & Lane

(Map 1)

Phlebotomus (*Idiophlebotomus*) *tubifer* Lewis & Lane, 1976: 59 [♀]; Lewis, 1978*b*: 252. Holotype ♀, INDIA (BMNH) [examined].

DISTRIBUTION. **India**: Lewis (1978*b*: 326, map); G. B. Modi, 1979, pers. comm., Sagar in Shimoga district, ♀ ♂.

***Phlebotomus* (*Idiophlebotomus*) sp. A**

(Map 1)

This is being described by Lewis & Dyce and is placed here in accordance with the first letter of its future name.

Subgenus *AUSTRALOPHLEBOTOMUS* Theodor

Phlebotomus subgenus *Australophlebotomus* Theodor, 1946: 99; Quate & Quate, 1967: 11, 14. Type-species: *Phlebotomus brevifilis* Tonnoir, 1935, by original designation.
Phlebotomus brevifilis group; Fairchild, 1952: 192, 194, 196, 198, 199.

Key to the species of subgenus *Australophlebotomus*

Females

1 Pharyngeal teeth short, about 5 μm.
Spermathecal ducts wrinkled, outlets touching. Cibarium with about seven to nine main teeth and several laterals, arch strong with lateral bulges. Maxilla with more than 150 ventral teeth. Pharynx largely brown . . . . ***brevifiloides*** (p. 136)
– Pharyngeal teeth long, about 25 μm 2
2 Spermathecal ducts with sleletal lattice near furca.
Maxilla with about 150 ventral teeth. Pharynx brown in hind half . . . ***brevifilis*** (p. 136)
– Spermathecal ducts without such lattice . . . . ***pexopharynx*** (p. 136)

Males

1 Aedeagus very short, less than half as long as coxite 2
– Aedeagus long or rather long, more than half as long as coxite 3
2 Plunger of sperm pump wide. Genital filament with thin-walled tip opening backward ***brevifilis*** (p. 136)

- Plunger of sperm pump narrow. Genital filament with thick-walled tip opening somewhat downward . . . . ***brevifiloides*** (p. 136)

3 Genital filament 3·6 length of pump which has plunger without expanded base. Inter-arcal area much wider than long. . . . . ***trifilis*** (p. 137)

- Genital filament 1·2–1·8 length of pump which has plunger with normal expanded base. Inter-arcal area about as wide as long 4

4 Antenna 3 = 1·6 length of labrum. Aedeagus with straight tip . . . . . ***papuensis*** (p. 136)

- Antenna 3 = 1·1 length of labrum. Aedeagus with up-turned tip . . . . . ***buccinator*** (p. 136)

Phlebotomus (*Australophlebotomus*) sp. B

(Map 1)

This is being described by Lewis & Dyce.

Phlebotomus (*Australophlebotomus*) *brevifilis* Tonnoir

(Map 1)

Phlebotomus brevifilis Tonnoir, 1935: 145 [♀ ♂]; Fairchild, 1952: 192. Specimens stated by Tonnoir to be ♀ and ♂ types being studied by Lewis & Dyce, AUSTRALIA (ANIC, Canberra).
Phlebotomus (*Australophlebotomus*) *brevifilis* Tonnoir; Theodor, 1948: 100, 108.

DISTRIBUTION. **Australia**: information mainly from A. L. Dyce.

Phlebotomus (*Australophlebotomus*) *brevifiloides* Fairchild

(Map 1)

Phlebotomus brevifiloides Fairchild, 1952: 194 [♀]. Holotype ♀, AUSTRALIA (CIH, Sydney).

DISTRIBUTION. **Australia**: information mainly from A. L. Dyce.

Phlebotomus (*Australophlebotomus*) *buccinator* Fairchild

(Map 1)

Phlebotomus buccinator Fairchild, 1952: 194, 195, 205 [♂]. Holotype ♂, AUSTRALIA: Cairns (SPHTM, Sydney).

Phlebotomus (*Australophlebotomus*) sp. C

(Map 1)

This is being described by Lewis & Dyce.

Phlebotomus (*Australophlebotomus*) *papuensis* Fairchild

(Map 1)

Phlebotomus papuensis Fairchild, 1952: 200 & 193, 195, 203 [♂]. Holotype ♂, PAPUA NEW GUINEA: Dobadura (CIH, Sydney).
Phlebotomus (*Australophlebotomus*) *papuensis* Fairchild; Quate & Quate, 1967: 11.

Phlebotomus (*Australophlebotomus*) *pexopharynx* Fairchild

(Map 1)

Phlebotomus pexopharynx Fairchild, 1952: 196 [♀]; Quate & Quate, 1967: 14. Holotype ♀, AUSTRALIA: Cairns (CIH, Sydney).

Phlebotomus* (*Australophlebotomus*) *trifilis Quate & Quate

(Map 1)

Phlebotomus (*Australophlebotomus*) *trifilis* Quate & Quate, 1967: 11 [♂]. Holotype ♂, Papua New Guinea: Vogelkop (BPBM, Honolulu).

Note. This species is presumably named after the three spines on the style.

Subgenus ***PHLEBOTOMUS*** Rondani & Berté

Phlebotomus subgenus *Phlebotomus* Rondani & Berté; Theodor, 1948: 96; 1958: 16; Quate, 1964: 238; Perfil'ev, 1968: 62, 63, 65, 79, 227; Hennig, 1972: 24, 51, 53 [this subgenus, *Euphlebotomus* and *Anaphlebotomus* seem to be related to the fossil *P. tipuliformis* and should perhaps be united under a common name]; Lewis, 1978*b*: 231.

Key to the species of subgenus *Phlebotomus*

Females

1 Most pharyngeal scaly teeth arranged obliquely and pointing backward . . . **bergeroti** (p. 137)
– Most pharyngeal scaly teeth not pointing backward **duboscqi** (p. 138), **papatasi** (p. 138), **salehi** (p. 141)

Males

1 Upper process of paramere not longer than paramere 2
– Upper process of paramere longer than paramere 3
2 Upper process of paramere clothed with hairs on all sides . . . . **duboscqi** (p. 138)
– Upper process of paramere clothed with hairs on hind part . . . . **salehi** (p. 138)
3 Antenna 3 = 0·27 to 0·34 mm long. Wing length about 2·2–2·7 mm. Coxite long, 0·55 to 0·6 mm. Style 0·37–0·41 mm long, distance between basal and middle spines less than that between middle and distal spines. Eye appearing small because head relatively short . **papatasi** (p. 138)
– Antenna 3 = 0·24–0·28 mm long. Wing length about 1·8–2 mm long. Coxite not long, 0·37–0·4 mm. Style 0·27 mm long, distance between basal and middle spines greater than or equal to that between middle and distal spines. Eye appearing large because head relatively long. Distal spines of surstyle long and thin . . . . **bergeroti** (p. 137)

Phlebotomus* (*Phlebotomus*) *bergeroti Parrot

(Map 2)

Phlebotomus papatasi var. *bergeroti* Parrot, 1934: 383 [♂]; 1941*b*: 237 [♀]; Parrot & Bellon, 1952: 60. Syntypes 3 ♂, Algeria (IP, Algiers).
Phlebotomus (*Phlebotomus*) *viduus* Parrot, 1936*a*: 34 [♀]. Syntypes 3 ♀, Ethiopia (IP, Algiers?). [Synonymized by Theodor, 1948: 106.]
Phlebotomus (*Phlebotomus*) *bergeroti* Parrot; Lewis & Büttiker, 1980 [synonymy including description of ♀ by Bellon in 1936]; Perfil'ev, 1968: 66; Artemiev, 1978: 16.

♀ (*extra fact*, Yemen, Taiz, 29.xi.1970). Leg formula 100, 106, 68; 103, 136, 76; 120, 175, 93 (0·78).
♂ (*extra fact*, Saudi Arabia). Head 0·41 (0·38–0·43) mm long, 0·22 (0·22–0·23) length of wing (n = 5).

Distribution. **Africa**: Abonnenc & Rioux (1961: 35, map). **Africa, Mediterranean area etc.**: Abonnenc (1972: 255, map). **Djibouti area**: Courtois (1972). **Ethiopia**: Danakil ('Asaita', 4.i.1968, 2 ♀ biting man, *R. W. A.*); Humera (29.v.1968, 1 ♂, *R. W. A.*); Kirk & Lewis (1952: 339). **Iran**: Theodor & Mesghali (1964: 286). **Morocco**: Rioux *et al.* (1975: 495, map). **Saudi Arabia**: Lewis & Büttiker (1980, map). **Somalia**: Burao (1913? 1 ♂, *R. E. D. B.*). **South Yemen**: Pringle (1960, 'Mazu' and Yashbum, assumed to be Wadi Yeshbum); Ba Zulayfah (x.1962, *S. A. S.*, see under *P. papatasi*). **Sudan**: Lewis & Kirk (1951: 565; 1957: 632, revised list). **United Arab Emirates**: Al Ain (Ain al Faidr, 1980, *G. B. W.*, det. *R. P. L.*). **Yemen**: Lewis (1974).

Note. This species is thermophilic and xerophilic in Afghanistan (Artemiev, 1978: 16). It bites man readily and has been suspected of transmitting CL in the central Sahara and sandfly-fever in Ethiopia (Abonnenc, 1972: 95).

Phlebotomus* (*Phlebotomus*) *duboscqi Neveu-Lemaire

(Map 2)

Phlebotomus duboscqi Neveu-Lemaire, 1906: 65 [♀ ♂]; Austen, 1909: 20; Abonnenc, 1958: 61; 1959: 333; Abonnenc & Larivière, 1958: 260 [egg & larva]; Abonnenc & Rioux, 1961: 32; Ashford, 1974: 607. Syntypes 6 ♀, 6 ♂, MALI (depository unknown).

Phlebotomus duboscqi Neveu-Lemaire; Picard, 1909: 165. [Mis-spelling.]

[*Phlebotomus pappatasi* (Scopoli); Picard, 1909: 165. Misidentification, Abonnenc, 1958: 65.]

Phlebotomus duboscqii Neveu-Lemaire; Alcock, 1911: 119. [Mis-spelling.]

Phlebotomus duboscqui Neveu-Lemaire; Newstead, 1912: 367; 1913: 124; Summers, 1913: 114. [Misspellings.]

[*Phlebotomus papatasii* (Scopoli); Newstead, 1913: 125. Misidentification, Abonnenc, 1958: 65.]

Phlebotomus roubaudi Newstead, 1913: 125 [conditional name]; 1914: 187; Rageau, 1951: 794. Holotype ♂, MAURETANIA (IP, Paris?). [Synonymized by Larrousse, 1921: 44; Abonnenc, 1958: 65.]

Phlebotomus (*Phlebotomus*) *roubaudi* Newstead; Parrot & Gougis, 1944: 40; Kirk & Lewis, 1946*a*: 42; 1946*b*: 120; 1947: 875; 1951: 424; Kervran, 1946: 155; Lewis & Kirk, 1957: 634; Perfil'ev, 1968: 4.

Phlebotomus (*Phlebotomus*) *duboscqi* Neveu-Lemaire; Kirk & Lewis, 1946*a*: 41; 1951: 427; Perfil'ev, 1968: 4, 65, 66; Abonnenc, 1972: 95.

Phlebotomus roubaudi var. *fourtoni* Floch & Abonnenc, 1948: 1. Holotype ♂, UPPER VOLTA (depository unknown). [Synonymized by Abonnenc, 1958: 65.]

Phlebotomus (*Phlebotomus*) *roubaudi* var. *fourtoni* Floch & Abonnenc; Kirk & Lewis, 1951: 325; Lewis & Kirk, 1954: 34.

♀ (*extra fact*, Senegal, 1977–1978). Leg formula 100, 108, 61; 101, 106, 60; 126, 173, 98 (0·75).

DISTRIBUTION. **Africa etc.**: Abonnenc (1972: 255, map; 1973: 185, northernmost point 20° near Akjoujt, Mauretania). **Ethiopia**: Ashford (1974: 607); Gemetchu *et al.* (1976: 81). **Gambia**: Snow (1979). **Ghana**: Nangodi (10.iv.1962, ♂, *D. J. L.*). **Sudan**: Hoogstraal & Heyneman (1969: 1155); Lewis & Kirk (1951: 566, map; 1957: 632, revised list); Qutubuddin (1962: 594). **Togo**: Abonnenc (1973: 190, map).

In the Senegal River valley the finding by Dedet *et al.* (1980) of only 30 *P. duboscqi* and two *P. rodhaini* with 2245 *Sergentomyia* exemplified the paucity of *Phlebotomus* in the tropics.

NOTE. *P. duboscqi* is probably more primitive than *bergeroti* or *papatasi*; its distribution corresponds with that of CL in West Africa; it is common in dwellings in Upper Volta, and has been suspected as a vector in Niger (Abonnenc, 1972: 34, 99) and Senegal (Abonnenc, 1973: 185; Hoogstraal & Heyneman, 1969: 1170). Dedet *et al.* (1979: 435, 436) found it infected with *Le. major* in Senegal.

Phlebotomus* (*Phlebotomus*) *papatasi (Scopoli)

(Map 2)

Bibio papatasi Scopoli, 1786: 55 [♀]. Type(s), ITALY (U, Pavia?).

? *Musca papatasi* (Scopoli) Gmelin, 1790: 2866; Costa, 1843: 6; Sinton, 1928: 300. [Position uncertain.]

? *Ciniphes molesta* Costa, 1840: 2225; 1843: 4. Syntype(s), ITALY (depository unknown). [Synonymized by Sinton, 1928: 300; Kirk & Lewis, 1951: 422; Perfil'ev, 1968: 1, 7 [*P. molestus* from Asia], 228 [as '*Cyniphes molesta*'].] [Position uncertain.]

Flebotomus papatasii (Scopoli) Rondani, 1840: 13; Costa, 1843: 4, 6 [Terra di Otranto] [♂, short note on terminalia; Scopoli's description of fly superficial].

Hebotomus papatasii (Scopoli) Rondani, 1843: 265, pl. 10, recognizable figure of style).

Hebotomus molestus (Costa); Rondani, 1843: 266 [habitat Kingdom of Naples; quotes '*Cyniphes molesta* J. Costa' and '*Cyniphes* J. Costa'].

Phlebotomus papatasi (Scopoli) Loew, 1847: 151; Saccà, 1950: 684 [early stages]; Hemming, 1958: 16, 189 [in official list of specific names]; Abonnenc, 1958: 63; 1959: 329; Schmidt & Schmidt, 1963: 567; Bhat & Modi, 1976: 265; Lysenko & Beliaev, 1977*b*: 263 [variation]; Guevara-Benîtez, Ubeda-Ontiveros & Morillas-Marquez, 1978: 824, 832.

Musca papatasii (Scopoli); Rondani, 1856: 178.

Phlebotomus papatasii (Scopoli); Noé, 1905: 722; Grassi, 1907: 356 ['J. Costa' mentioned], 359, 384, [all Italian Phlebotominae thought to be one species]; 1908: 681 [two species known in Rome]; Summers, 1911: 105; Handlirsch, 1925: 96 [in list of names not to be changed]; Pierantoni, 1925: 4; Sinton, 1928:

300 [synonymy]; Patton & Evans, 1929: 101; Shchurenkova, Demina & Pavlova, 1929: 683; Isaev, 1935: 95, 103 [cibarium, spermatheca etc.]. [Mis-spellings.]

Phlebotomus pappatasi (Scopoli); Picard, 1909: 164. [Mis-spelling.]

Phlebotomus pappatasii (Scopoli); Mansion, 1913: 639. [Mis-spelling.]

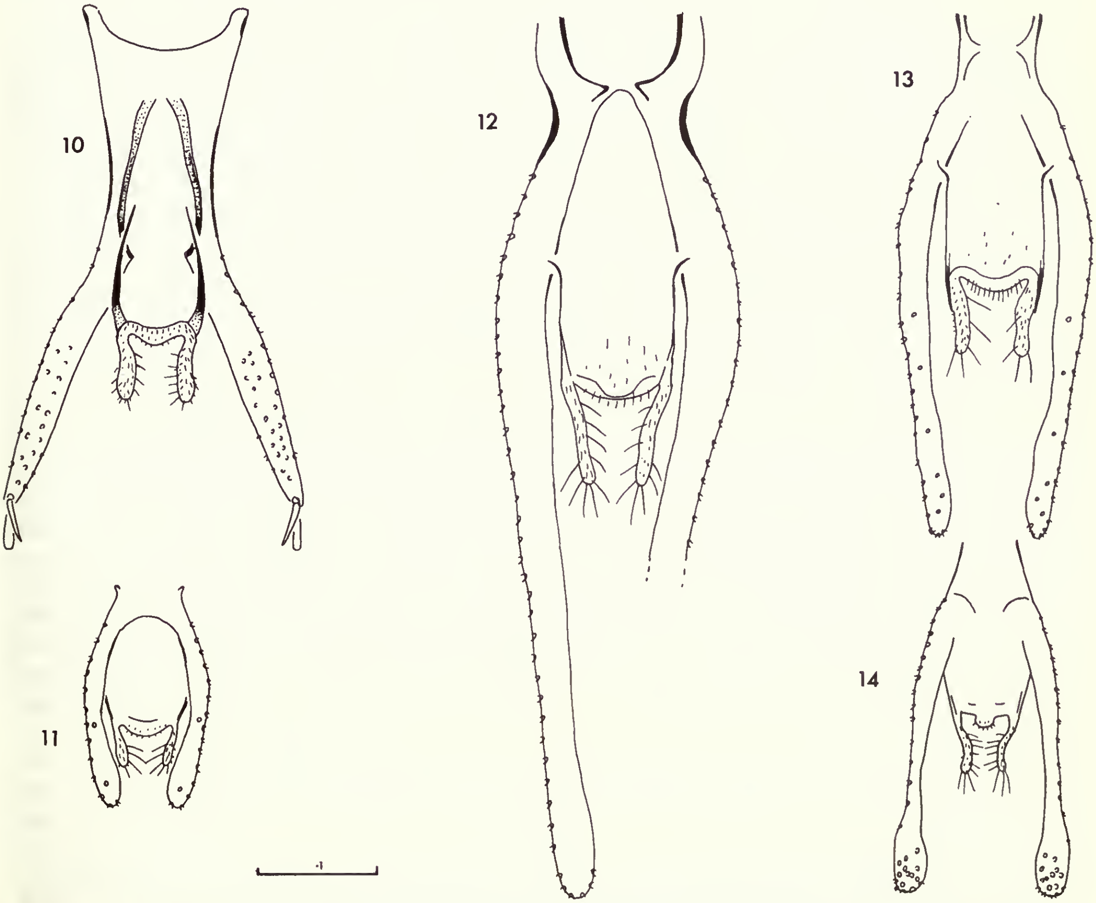
Phlebotomus (*Phlebotomus*) *papatasi* var. *breviventris* Ristorcelli, 1941: 369 [♀]. Syntypes 2 ♀, MOROCCO (depository unknown) [treated as former subspecies according to ICZN, 1974: Article 45 (e)]. **Syn. n.**

Phlebotomus (*Phlebotomus*) *papatasi* (Scopoli); Theodor, 1948: 86, 106, [genus and species in '*nomina conservanda*' of Handlirsch, 1925]; 1958: 17; Kirk & Lewis, 1951: 422 [synonymy, Handlirsch's list]; Parrot, 1953: 115. Fairchild, 1955: 188; Lewis & Kirk, 1957: 632; Quate, 1964: 240; Perfil'ev, 1968: 1, 5, 49 [larva], 50, 60 [egg], 62, 65, 66, 228; Croset, 1969: 360; Rioux & Golvan, 1969: 68; Bailly-Choumara, Abonnenc & Pastre, 1971: 436; Artemiev, 1972: 300 [spiracles]; Biocca, Coluzzi & Constantini, 1977*a*: 158, 160 [absent from Milan area and very rare in Italy where there are seven species]; 1977*b*: 31; Artemiev, 1978: 15; Lewis, 1978*b*: 233 [synonymy]; Croset, Rioux, Maistre & Bayar, 1978: 726, 732; Lewis & Büttiker, 1980.

Phlebotomus papatasi papatasi (Scopoli); Abonnenc & Rioux, 1961: 31 [in distinction from *bergeroti*].

♀ (*extra facts*). Leg formula (Hofuf, Saudi Arabia, n = 10): 100, 103·0 (96–108), 58·4 (55–62); 100·6 (98–103), 124·6 (114–133), 69·2 (64–74); 119·7 (117–123), 164·3 (154–174), 91·2 (87–96).

♂ (*extra facts*). Head 0·42 (0·38–0·42) mm long, 0·208 (0·20–0·21) length of wing (n = 5, Saudi Arabia). Leg formula (Hofuf, Saudi Arabia, n = 10): 100, 110·8 (104–117), 63·4 (57–79); 93·7 (67–103), 132·5 (124–135), 74·9 (69–78); 114·1 (110–118), 165·6 (158–175), 91·9 (80–97). Basitarsus 3/femur 3: India, 84·1 (79–86, n = 10); Saudi Arabia, 80·7 (71–87, n = 10).



Figs 10–14 Abdominal segment 9 of males of *Phlebotomus* species in dorsal view. (10) *P. papatasi*; (11) *P. alexandri*; (12) *P. guggisbergi*; (13) *P. hindustanicus*; (14) *P. argentipes*.

Distribution. **Western part of Old World**: Beklemishev & Dolmatova (1948: 354, map); Croset (1969: 275, map); Dolmatova & Demina (1971: 121, map); Hennig (1966: 59, 62, map to indicate marginal speciation); Lewis *in* Tesh *et al.* (1976: 666, map); Perfil'ev (1968: 89). **Africa, Mediterranean area etc.**: Abonnenc (1972: 255, map). **Indian subcontinent**: Lewis (1978*b*: 324, map). **Afghanistan**: Artemiev (1974: 157, map; 1978: 15); Arsenieva & Neronov (1978: 30, 32); Nadim *et al.* (1979: 33, Robatak, 36°09′N, 68°24′E). **Algeria**: Biskra (20.v.1893, *A. E. E.*); Dedet & Addadi (1977: 86); Dedet *et al.* (1977: 256). **Crete**: Hadjinicolaou (1958: 974, 975); Hertig (1949*a*: 782, 787–789. **Egypt**: Abu Aweigila (Sinai, vii.1979, *Y. S.*); Alexandria, Aswan, Asyut, Bahtim, Beni Suef, Giza, Imbaba, 'Kafra el Sheikh', Luxor, Maadi, Marsa Matruh, Matariya, Qaliubiya, Rashda, Sharqiyah and Tanta (1967, *M. A. R.*); Birqet Qarun (ix.1945, *R. L. C.*); Siwa (23.v.1935, *J. O. C.*); Zein el Dine (1972: 271, Dakhla oasis). **Ethiopia**: Gemetchu *et al.* (1977: 209). **France**: Colas-Belcour (1958: 826); Raynal (1954: 315, map); Rioux & Golvan (1969: 51, 72, maps). **Greece**: Hadjinicolaou (1958: 968–973); Hertig (1949*a*: 778, 779, 781–783, 786–789); Léger *et al.* (1979: 17); Volo (15.viii.1892, ♂, *E. M.*, sent to BMNH 18.viii.1892 by A. A. Merlin, H. M. Consul, Volo). **Hungary**: 'Carlapago' (12.vii.—, *K. K.*, bequeathed to BMNH in 1929 by *A. E. E.*). **India**: Modi *et al.* (1978: 748, map); Modi & Soman (1978: 159); Pandya *et al.* (1977: 133–135). **Iran**: Lewis, Mesghali & Djanbakhsh (1961: 206); Mesghali (1961: 26; 1963: 1073); Nadim, Mesghali & Javadian (1977: 215). **Iraq**: Ahmad (1976: 86, 96, 97); Amara (14.vi.1918, *P. A. B.*); Basra (x.1918, *H. W. L.*); Pringle (1953: 723, map). **Israel**: Adler & Theodor (1929: 271); Pazael, c. 31°67′N, 35°33′E, 12.vii.1979, *Y. S.*). **Italy**: Biocca *et al.* (1977*a*: 160, map; 1977*b*: 20, rare, 29, map); Corradetti *et al.* (1956*a*: 6, map); Hertig (1949*a*: 796); Maroli & Bettini (1977: 318). **Jordan**: Awjan (32°02′N, 36°04′E, 15.vii.1978, *E. K. S.*); Sweilah (32°02′N, 35°50′E, 2.vii.1978, *E. K. S.*). **Kuwait**: Al Fantas, 29°10′N, 48°06′E, Al Farwaniya area, 29°16′N, 47°55′E, 'Al Kazuma', Kuwait & 'Malboula', 1974, *K. B.*); Hussien & Behbehani (1976). **Libya**: Ashford *et al.* (1977: 265, Al Birkah, 32°05′N, 20°05′E, etc.); Nalut & Yafran area, 32°04′N, 12°31′E, *M. A.*). **Morocco**: Bailly-Choumara *et al.* (1971: 453, map); Gaud (1954: 95). **Oman**: Barka (x.1979, *G. S.*). **Pakistan**: Robinson & Blackham (1912). **Sardinia**: Hertig, 1949*a*: 798). **Saudi Arabia**: Lewis & Büttiker (1980, map). **Southern Yemen**: Amwadhia, 45°50′N, 13°46′E, Ba Tays, 13°20′N, 45°18′E, Ba Zulayfah, 13°50′N, 45°47′E, Dali, 13°42′N, 44°44′E, Khodad, 13°09′N, 44°50′E, Mukalla area, Nigda, 13°56′N, 45°55′E, Sah, 15°34′N, 48°51′E and Saywun area, 15°56′N, 49°27′E (1962, *S. A. S.*); 'Haski' (1939, ♂, *P.*); Sha'b Subeihi, 13°05′N, 44°30′E(?) (iv.1954, *N. L. C.*). **Spain**: Gil Collado (1977: 186, map); Guevara-Benîtez *et al.* (1978: 814); Najera (1937: 1488); Zariquiey (1944: 18). **Sudan**: Akasha, Dal Island, Ferka, Sai Island, 1980, *G. S.*); Hoogstraal & Heyneman (1969: 1544). **Syria**: Adler & Theodor (1929: 271); Arab Hassan, 36°30′N, 37°51′E, 'Halab Halwan', 'Kanat Albu', 'Klemis', 'Khan el Sobol', 'North Kena Halab' (1978, *K. Z. D.*). **Tunisia**: Chadli, Dancescu *et al.* (1970: 363); Dancescu, Romain *et al.* (1970: 357); Croset (1969: 273, map); Croset *et al.* (1978: 727, map); Dedet (1971: 157). **Turkey**: Yasarol (1980). **U.S.S.R.**: Gaibov (1975*a*: 55, Fergan area; 1976: 49, Surkhandar'ya area); Grebelsky (1937: 200, Khiva); Karapet'yan & Babayants (1979: 67, Bayram-Ali); Latyshev & Posyval (1937: 184, Seraks); Petrishcheva (1937: 148); Ponyrovskyi (1971: 495, Sumbar Valley). **Yemen**: Büttiker & Lewis (1979: 371). **Yugoslavia**: Trebinje (barracks, 24.vii.1908, *S. T.*); Živković (1972: 27).

Note. It is relevant to review briefly some aspects of the taxonomic history of this, the type-species of the genus and the first-known sandfly in the world, and an important disease vector. In pre-Linnaean times, in 1691, in Rome Philippo Bonanni (discussed by M. Lavoipierre in a paper cited by Theodor, 1948: 86, and Lewis, 1977: 94) published the first description of a (male) *Phlebotomus* but the species is unknown and may not have been *papatasi*. The next description, of a female of *Bibio papatasi* from the Milan area once known as Insubria, was published in 1786 in the city of Pavia, then in the Austrian Empire, by Johann Anton Scopoli (1723–1788), an eminent naturalist (Ambrosi, 1889; Gilbert, 1977; Higgins, 1963; Voss, 1881). The species was named from 'pappataci', the vernacular name for a sandfly, which means a silent gorger. A collection of Scopoli was probably destroyed by shipwreck and fire in 1766 (Horn & Kahle, 1935–1937); he was shipwrecked on the River Inn in Bavaria and had two fires in his house in Istria (Voss, 1882: 21). However, he probably studied *P. papatasi* later, when professor of chemistry and botany at the University of Pavia from 1776 to 1788 (Conci, 1975: 1013). The type is not in the NM, Vienna and is presumed to be lost. Schiner (1856: 405) praised Scopoli's work on Diptera, which had been disregarded until recently brought to light by English workers, but pointed out that some of his descriptions were out of date by modern standards. His figure of *P. papatasi* is rather crude.

In 1840, when *P. papatasi* was the only known sandfly in the World, '*C. molesta*', from Terra di Otranto, a former province around Otranto, was described by Giuseppe Costa, son of O. G. Costa (1787–1867), professor of zoology at Naples from 1836 to 1849 (Conci, 1975: 887). In 1843, in a paper in antiquated Italian, G. Costa linked the names *molesta* and *papatasi* but seemed to consider the species different, pointed out that *Ciniphes* was an ancient name [gnat in Latin, Bailey, 1828: 361] and that papatasio was the vulgar name for a notorious insect in parts of Lombardy. Also in 1843 Camillo Rondani, the eminent entomologist of Parma (Gilbert, 1977: 322; Meade, 1879: 138) figured the style of a species from central Italy which is now generally regarded as *P. papatasi*, gave the area of *H. molestus* as the Kingdom of Naples, and described another species of sandfly (*Sergentomyia minuta*) from the plain of Parma. Grassi (1907: 8), who referred to Rondani's descriptions as imperfect, recognized (Grassi, 1908) two species of *Phlebotomus* s. str. in Italy, and Biocca *et al.* (1977*a*) reported seven, stated that *P. papatasi* was very rare, and showed no record of it from Pavia. The listing of *P. papatasi* among 'nomina conservanda' did not settle the specific name because it was intended to decide on the generic name. It is uncertain whether *B. papatasi* (Scopoli, 1786) and *H. papatasii* (Rondani, 1843) were the same species but here, for practical reasons, the situation is regarded as stabilized and the synonymy as shown above.

The spelling *papatasii* is a mistake which lasted for more than a century.

The description of *P. p.* var. *breviventris* does not seem to justify its recognition as a taxon.

Small females (and males) are sometimes seen with a wing length much less than the 2·0 to 2·4 mm given by Theodor (1958: 18). For example, one from Israel (Pazael, 12.vii.1979) had a WL of 1·78 mm and width of 0·48 mm.

In the U.S.S.R. *P. papatasi* needs a warm summer and a mild winter, with a mean temperature not below −6°C and a short rainy season, and it has a limited altitude range (Perfil'ev, 1968: 89). In Afghanistan it is found up to 2100 m but occurs mainly in the plains where the water table is high (Artemiev, 1978: 15). This species is largely domestic over most of its range (Lewis & Büttiker, 1980) and, perhaps for this reason, is widespread and abundant. It is mainly domestic in France, Tunisia and Yugoslavia (Croset *et al.*, 1978: 726, 738) and Greece (Léger *et al.*, 1979: 19), and purely domestic in Spain (Gil Collado, 1977: 185). *P. papatasi* is much more anthropophilic than some species (Strelkova, 1974).

It has been suspected of transmitting VL in some areas where no likely vector was found (Lewis & Büttiker, 1980), including Iraq (Abul-hab & Azawi, 1978: 406; Adler, 1964: 79; Azawi & Abul-hab, 1976; Sukkar, 1972: 69) but is evidently a poor potential vector (Abonnenc, 1972: 100; Saf'yanova, 1967: 38; Williams & Coelho, 1978: 17), and another species may be responsible.

P. papatasi and *P. sergenti* are the main vectors of CL to man (Theodor, 1964: 488; Wilcocks & Manson-Bahr, 1972: 135). *P. papatasi* (according to Lysenko & Beliaev, 1977*b*: 262) and *P. caucasicus* transmit CL among rodents in Central Asia (Theodor, 1964: 489), and Saf'yanova (1977: 257, 259) has distinguished two types of zoonotic foci in the U.S.S.R., a dangerous one with *P. papatasi*, and another with *P. caucasicus* and *P. andrejevi* as vectors under different conditions. In some areas *P. papatasi* transmits zoonotic *Le. t. major* from animals to man (Adler, 1964: 67; Lysenko, 1971: 516; Mŏskovskij & Dukhanina, 1971: 732; Sergiev, 1979: 199). *P. papatasi* is the principal vector of zoonotic CL in Central Asia (Saf'yanova & Alekseev, 1977: 154) and appears to be the vector of CL in Iran (Adler, 1964: 791; Bray, 1974: 93; Javadian *et al.*, 1977: 203; Nadim & Rashti, 1971: 100), Saudi Arabia (Nadim, Rashti & Ashi, 1979), Afghanistan (Nadim, Javadian *et al.*, 1979) and India (Lewis, 1977: 134). This species is a troublesome biter and a well known vector of CL in many areas (Abonnenc, 1972: 100) including Israel (Molyneux, 1977: 49; Egoz & Michaeli, 1978) and the Mediterranean basin generally (Dedet, 1979: 72). It transmits sandfly fever.

Phlebotomus* (*Phlebotomus*) *salehi Mesghali

(Map 2)

Phlebotomus (*Phlebotomus*) *salehi* Mesghali, 1965: 264 [♂]; Mesghali & Rashti, 1968: 770 [♀]; Kalra & Lewis, 1976: 522; Lewis, 1978*b*: 235; Artemiev, 1978: 16. Holotype ♂, IRAN (IPH, Tehran).
[*Phlebotomus saheli* Mesghali; Killick-Kendrick, 1978: 300. Mis-spelling.]

♂ (*extra fact*, India). Leg formula 100, 113, 63; 122, 172, 98; 125, 170, 98 (0·74).

DISTRIBUTION. **India**: Lewis (1978*b*: 235, map). **Iran**: Mesghali & Rashti (1968: 768, 769, map); Nadim *et al.* (1977: 215).

NOTE. *P. salehi* probably transmits CL among rodents in India (Kalra & Lewis, 1976; Killick-Kendrick, 1978: 298).

Subgenus *PARAPHLEBOTOMUS* Theodor

Phlebotomus subgenus *Paraphlebotomus* Theodor, 1948: 97; 1958: 19; 1965: 175; Perfil'ev, 1968: 49 [larva], 63, 66, 80, 232; Abonnenc, 1972 [as *sergenti* group]; Lewis, 1978*b*: 235. Type-species: *Phlebotomus sergenti* Parrot, 1917, by original designation.

The inclusion of *P. kazeruni* necessitates the following slight change to Theodor's (1958) definition of the subgenus: 'usually the spermatheca segmented. . .; in *P. kazeruni* very short, unsegmented and expanded distally.'

Key to the species and subspecies of subgenus *Paraphlebotomus*

Females

1 Antenna 3 short (0·12–0·16 mm), 0·5–0·6 length of labrum . . . 2
– Antenna 3 long (0·22–0·33 mm), 0·7–1·0 length of labrum . . . 3
2 Armature about 0·17 length of pharynx with straight hind edge; pharynx conical with hind width 2·0–2·5 times fore width . . . ***alexandri*** (p. 143)
– Armature about 0·25 length of pharynx with distinctly concave hind edge and smaller teeth; pharynx bulging, with hind width 3–4 times fore width . . . ***marismortui*** (p. 146)
3 Spermatheca not segmented, its body about as long as wide. Mesonotum brown . . . ***kazeruni*** (p. 145)
– Spermatheca segmented, its body much longer than wide . . . 4
4 Pharyngeal teeth weakly developed, most obliquely arranged, occupying only fifth or sixth length of pharynx . . . ***andrejevi*** (p. 144), ***caucasicus*** (p. 144), ***mongolensis*** (p. 147)
– Pharyngeal teeth very distinct, hind ones rounded, most teeth pointing inward and posteriorly, armature usually occupying hind 0·16 or 0·20 of pharynx length . . . 5
5 Pharyngeal armature 0·15–0·17 length of pharynx . . . 6
– Pharyngeal armature 0·20–0·33 length of pharynx . . . 7
6 Antenna 3 = 0·44 mm long. Africa and Saudi Arabia . . . ***saevus*** (p. 147)
– Antenna 3 = 0·31–0·33 mm long. U.S.S.R. . . . ***sergenti similis*** (p. 148)
7 End segment of spermatheca bell-shaped on narrow stem. Pharyngeal teeth numerous . . . ***chabaudi*** (p. 145)
– End segment of spermatheca ring-like and sessile . . . 8
8 Spermatheca with four or five segments. Wing index 1·2–1·9 . . . ***sergenti sergenti*** (p. 147)
– Spermatheca with seven to nine segments . . . 9
9 Pharynx with eight or nine rows of four to five teeth. Antenna 3 about 0·23 mm long ***jacusieli*** (p. 145)
– Pharynx with 10–12 rows of six to eight teeth. Antenna 3 about 0·26–0·30 mm long . ***nuri*** (p. 146)

Males

1 Basal lobe of coxite with most of hairy surface ventral, lobe very large, about 40 μm wide ***caucasicus*** (p. 144)
– Basal lobe of coxite with all or most of hairs terminal . . . 2
2 Antenna 3 short (0·12–0·16 mm), 0·7–0·9 length of labrum. Sperm pump small (0·12 mm) with plunger slightly wider than barrel . . . 3
– Antenna 3 long (0·24–0·34 mm), 1·0–1·4 length of labrum. Sperm pump large (0·17–0·20 mm) with plunger much wider than barrel . . . 4
3 Style three times as long as thick, less than half as long as coxite. Two spines on style terminal ***marismortui*** (p. 146)
– Style four times as long as thick, more than half as long as coxite. One spine of style terminal, the next at 0·7 . . . ***alexandri*** (p. 143)
4 Aedeagus with a narrow tip . . . 5
– Aedeagus tip curving outward and slightly backward so that in side view it appears angular, prow-shaped or occasionally rounded . . . 6

5 Lobe of coxite large, about 0·080 mm long. Tip of aedeagus pointed . . . . . ***saevus*** (p. 147)
– Lobe of coxite small, about 0·034 mm long. Tip of aedeagus narrowly rounded . ***chabaudi*** (p. 145)
6 Style less than half as long as coxite, three times as long as thick. Basal lobe of coxite slender, distinctly longer than thick 7
– Style length equal to or more than half that of coxite 8
7 Basal lobe of coxite 0·06 mm long and 0·02 mm wide with small scarcely differentiated head. Surstyle 0·26–0·28 mm long . . . . ***sergenti sergenti*** (p. 147)
– Basal lobe of coxite 0·07–0·08 mm long and 0·03 mm wide with rounded slightly differentiated head. Surstyle 0·31–0·32 mm long. U.S.S.R. . . . . ***sergenti similis*** (p. 148)
8 Style about half length of coxite, about four times as long as thick. Basal lobe of coxite about 0·03 mm wide. Tip of aedeagus appearing rounded or prow-shaped in side view . . . . ***kazeruni*** (p. 145)
– Style longer than half length of coxite 9
9 Second spine of style at 0·7 10
– Second spine of style at 0·8 or nearer tip 11
10 Style 3·3 times as long as wide . . . . ***mongolensis*** (p. 147)
– Style 4·0 times as long as wide . . . . ***nuri*** (p. 146)
11 Style 0·35 length of coxite. Basal lobe of coxite 0·08 mm wide . . . . . ***andrejevi*** (p. 144)
– Style 0·53 length of coxite. Basal lobe of coxite 0·07 mm wide . . . . . ***jacusieli*** (p. 145)

Phlebotomus* (*Paraphlebotomus*) *alexandri Sinton

(Map 3)

Phlebotomus sergenti var.; Newstead, 1920: 309 [♂]. [Synonymized by Sinton, 1928: 308.]
Phlebotomus sergenti var. *alexandri* Sinton, 1928: 308 [♂]; Adler, Theodor & Lourie, 1930: 533 [♀]. Lectotype ♂, IRAQ: Amara, 19.ix.1918 (*P. A. B.*) (BMNH), here designated [examined].
Phlebotomus (*Paraphlebotomus*) *alexandri* Sinton; Perfil'ev, 1968: 63, 67, 72–74, 241; Croset, 1969: 285; Artemiev, 1978: 17; Croset, Rioux, Maistre & Bayar, 1978: 728, 732; Lewis & Büttiker, 1980 [synonymy].
Phlebotomus (*Phlebotomus*) *alexandri* Sinton; Abonnenc, 1972: 102, 103 ['Localité type: Amara (Mésopotamie). Holotype: Déposé au B. M.']; Guevara-Benîtez, Ubeda-Ontiveros & Morillas-Marquez, 1978: 833.

♀ (*extra fact*, Saudi Arabia, Wadi Mizbil, 11.viii.1977). Leg formula 100, 94, 51; 99, 115, 62; 124, 153, 87 (1·72, 0·55).

DISTRIBUTION. **Africa, Mediterranean area etc.**: Abonnenc (1972: 256, map); Croset (1969: 289, map). **Afghanistan**: Artemiev (1974: 157, map); Nadim *et al.* (1979: 33, Robatak). **Algeria**: Dedet (1979, map in *litt.*); Dedet & Addadi (1977: 86); Rioux *et al.* (1970: 877). **China**: Xiong *et al.* (1964, Xinjiang); Wang *et al.* (1963, Gansu Province). **Cyprus**: Croset *et al.* (1978: 729). **Djibouti area**: Courtois (1972). **Ethiopia**: Gemetchu *et al.* (1977: 209). **Greece**: Hertig (1949*a*: 781, 784–786); Léger *et al.* (1979: 17). **Iran**: Lewis *et al.* (1961: 306); Mesghali (1961: 55, map); Nadim *et al.* (1977: 215); Theodor & Mesghali (1964: 286). **Iraq**: Ahmad (1976: 86, 98); Pringle (1953: 721). **Israel**: Theodor (1947: 95). **Pakistan**: Lewis (1978*b*: 325, map). **Rumania**: Duport *et al.* (1971: 387). **Saudi Arabia**: Lewis & Büttiker (1980, map). **Spain**: Rioux *et al.* (1974*a*: 121, map). **Tunisia**: Croset (1969: 287, map); Croset *et al.* (1970: 872; 1978: 727, map). **Turkey**: Houin *et al.* (1971: 638); Yasarol (1980). **United Arab Republic**: Al Ain (*G. B. W.*, 1980, Ain al Faidr, det. *R. P. L.*). **U.S.S.R.**: Croset *et al.* (1978: 728, Crimea); Gaibov (1975*a*: 55; 1975*b*, Fergan area); Karapet'yan & Babayants (1979: 67, Bayram-Ali, 37°37′N, 62°10′E); Latyshev & Pozyvai (1937: 184); Petrishcheva (1935: 206; 1937: 148); Rasnitsyna (1974). **Yemen**: Lewis (1974*b*).

NOTE. Newstead cited two males of '*sergenti* var.' and also six females which prove to be another species. All eight are in the BMNH.

In Afghanistan *P. alexandri* is mainly a mountain species, is thermophilic and somewhat hydrophilic, and bites man readily (Artemiev, 1978: 17). It may play some part in VL transmission in China (Xiong *et al.*, 1963*b*: 610), and is considered to be an important vector of CL in the southern U.S.S.R. (Dedet, 1979: 72; Petrishcheva, 1971: 573). Females have been found infected with flagellates in a CL area of Iran (Javadian *et al.*, 1977: 203, 204) and the species is suspected of transmitting CL in Tunisia (Croset *et al.*, 1978: 729), owing to its relationship to *P. sergenti*.

Phlebotomus (Paraphlebotomus) andrejevi Shakirzyanova

(Map 3)

Phlebotomus sergenti var. *andrejevi* Shakirzyanova, 1953: 103 [♀ ♂]; Gaibov, 1956: 63. Syntypes ♀, about 760 (10 per cent of 7613), U.S.S.R. (depository unknown).

Phlebotomus (*Paraphlebotomus*) *andrejevi* Shakirzyanova; Theodor & Mesghali, 1964: 286 [till then unknown outside the U.S.S.R.]; Perfil'ev, 1968: 67, 72, 249; Croset, Abonnenc & Rioux, 1970: 867; Lewis, 1971: 535 [close to *caucasicus*]; Artemiev, 1974: 159.

Phlebotomus (*Paraphlebotomus*) *mofidii* Theodor & Mesghali, 1964: 289; Croset, Abonnenc & Rioux, 1970: 867. Holotype ♂, IRAN (BMNH) [Synonymized by Artemiev, 1978: 18.]

DISTRIBUTION. **Afghanistan**: Artemiev (1974: 157, map; 1978: 18). **Iran**: Theodor & Mesghali (1964: 287, 290, north-east, partly as *mofidii*). **Mongolia**: Artemiev (1978: 18); Neronov & Gunin (1978: 23, Bayan-Khongorsk, 45°30'N, 99°30'E, central, eastern and southern Gobi). **U.S.S.R.**: Dergacheva (1974: 1668, Karshinskaya Steppe); Dergacheva & Turzhanova (1977, Mangyshlak Peninsula); Dergacheva & Zerikhina (1974: 425); Karapet'yan & Babayants (1979: 67, Bayram-Ali); Perfil'ev (1968: 251, Alma Ata Province and Kzyl-Orda); Rasnitsyna (1974); Theodor & Mesghali (1964: 287, 290).

NOTE. In the U.S.S.R. (Eliseev & Dergacheva, 1972) and in Afghanistan (Artemiev, 1978: 18) this species occurs mainly in sandy deserts, and in south-east Turkmenia it and *P. caucasicus* live in drier areas than *P. papatasi*, according to Saf'yanova (1979: 78). In the U.S.S.R. (Dubrovsky, 1976; Sergiev, 1979: 199) *P. andrejevi* plays a major part in disseminating *Le. tropica major*.

Phlebotomus (Paraphlebotomus) caucasicus Marzinowsky

(Map 3)

Phlebotomus (*Hebotomus, Haemasson*) *grimmi* Porchinski, 1876: 32 [♂]; Perfil'ev, 1968: 11. Type(s), U.S.S.R.: Baku (depository unknown). [A senior synonym which should be suppressed; discussed below.]

Phlebotomus caucasicus Marzinowsky, 1917: 613 [♂]; Popov, 1926: 241; 1935: 108; Marzinowsky & Shchurenkova, 1929: 67; Adler, Theodor & Lourie, 1930: 531; Isaev, 1935: 103 [cibarium]; Perfil'ev, 1935: 98. Type(s), U.S.S.R. (U, Moscow?).

[*Phlebotomus sergenti* Parrot; Newstead, 1920: 307 [♀]; Nasonov, 1926: 240. Misidentifications.]

Phlebotomus li Popov, 1926: 241; Khodukin, 1929: 92; Sinton, 1928: 309; Shchurenkova, 1929*a*: 674. Syntypes 18 ♂, U.S.S.R.: Armenia (MI, Moscow?). [Synonymized by Marzinowsky & Shchurenkova, 1929: 673.]

Phlebotomus grimmi Porchinsky; Perfil'ev, 1937 [status not clear]; 1960: 271 [regarded as a senior synonym of *caucasicus*]; 1968: 7, 11, 236 [description of coxite insufficient for identification; specific independence first discussed by Nasonov.]

Phlebotomus sergenti var. *lii* Popov; Popov, 1928: 33.

Phlebotomus selectus Khodukin, 1929: 99. Syntypes ♀ ♂, U.S.S.R.: Andizhan (US, Tashkent?). [Synonymized by Perfil'ev, 1968: 236.]

Phlebotomus (*Paraphlebotomus*) *grimmi* Porchinsky; Perfil'ev, 1963: 69; 1968: 1, 7, 49 [larva], 50, 62, 67, 72, 74, 233.

Phlebotomus (*Paraphlebotomus*) *caucasicus* Marzinowsky; Theodor, 1958: 19; Theodor & Mesghali, 1964: 287 [identity of *grimmi* uncertain]; Perfil'ev, 1968: 11; Croset, Abonnenc & Rioux, 1970: 864; Artemiev, 1974: 158; 1978: 18; Lewis, Young, Fairchild & Minter, 1977: 326 [discussion].

♀ (*extra fact*, Iran, Abs Forushan, 5.vii.1969). Leg formula 100, 114, 72; 100, 131, 79; 121, 175, 98 (0·96); tibia 3 = 176 in ♂.

DISTRIBUTION. **Afghanistan**: Artemiev (1974: 157, map); Nadim *et al.* (1979: 33, Robatak). **China**: Xiong *et al.* (1964, Xinjiang). **Iran**: Lewis *et al.* (1961: 206); Mesghali (1961: 25, map); Theodor & Mesghali (1964: 288, species mainly in the north). **U.S.S.R.**: Beklemishev & Dolmatova (1948: 358, map); Dergacheva (1974: 1668, Karshinskaya steppe); Dergacheva & Zerikhina (1974: 524); Gaibov (1975*a*: 55, Fergan area); Grebelsky (1937: 200, Khiva); Karapet'yan & Babayants (1979: 67, Bayram-Ali); Khodukin (1929, Tashkent); Latyshev & Posyvai (1937: 184, Serakhs); Marzinowsky & Shchurenkova (1929: 672); Perfil'ev (1968: 89, 236, Andizhan, Baku and Tashkent); Petrishcheva (1937: 148); Ponirovsky (1971: 495, Sumbar Valley); Rasnitsyna (1974); Zakhar'yants (1958).

NOTE. The above citations are selected from the complex taxonomic history of this species. Artemiev (1976, in *litt.*) called it *caucasicus* because, before Perfil'ev's (1960) paper, the name *grimmi* had been out of use for more than 50 years. During the 49 years from 1925 to 1973 the *Zoological Record* cited *caucasicus* seven times and *grimmi* not at all. In 1975 and 1976 the *Review of applied Entomology* (Series B) did not mention *grimmi*, but recorded citations of *caucasicus* by 11 authors in 11 publications, and two other citations by one of the authors. I propose to request the ICZN to suppress the name *grimmi* according to Articles 23 (a–b) and 79 (1973).

This species occurs in moderately hot and dry regions (Perfil'ev, 1968: 89), and was considered to transmit VL in Central Asia and Kazakhstan (Sergiev, 1979: 208). It plays a major part in disseminating *Le. tropica major* in the U.S.S.R. (Dubrovsky, 1976: 275; Hoare, 1949: 167; Lewis, 1977: 134; Lysenko, 1971: 516; Sergiev, 1979: 199, 208). Perfil'ev (1968: 139) reported that it probably transmitted *Le. tropica* among rodents while the relatively anthropophilic *P. papatasi* and *P. sergenti* passed it on to man. It has been found infected with flagellates in gerbil burrows in Iran (Nadim & Rashti, 1971: 100) and may transmit CL among gerbils in Afghanistan (Nadim *et al.*, 1979: 33).

Phlebotomus* (*Paraphlebotomus*) *chabaudi Croset, Abonnenc & Rioux

(Map 3)

Phlebotomus (*Paraphlebotomus*) *chabaudi* Croset, Abonnenc & Rioux, 1970: 864 [♂]; Rioux, Croset & Guy, 1970: 877; Croset, Léger, Abonnenc & Rioux, 1974: 104 [♀]; Rioux, Croset & Léger, 1974: 506; Dedet & Addadi, 1974: 309 [♀]; Rioux, Croset, Léger, Benmansur & Soussi, 1975: 497; Croset, Rioux, Maistre & Bayar, 1978: 729, 732. Holotype ♂, TUNISIA (IP, Paris).

Phlebotomus chabaudi Croset, Abonnenc & Rioux; Guevara-Benîtez, Ubeda-Ontiveros & Morillas-Marquez, 1978: 833.

♀. Leg formula after Dedet & Addadi, 100, 128, 80; 93, 143, 83; 114, 183, 108 (0·94).

DISTRIBUTION. **Algeria**: Dedet (1979, map in *litt.*); Dedet & Addadi (1974: 308, Biskra; 1977: 86); Rioux *et al.* (1970: 877, Ghardaia). **Morocco**: Rioux *et al.* (1974: 99, 100, map; 1975: 495, map). **Spain**: Rioux *et al.* (1974*b*: 505, map). **Tunisia**: Croset *et al.* (1970: 872, map; 1978: 727, map, 731).

NOTE. *P. chabaudi* is suspected of being a vector of CL in North Africa (Croset *et al.*, 1978: 731; Dedet, 1979: 72).

Phlebotomus* (*Paraphlebotomus*) *jacusieli Theodor

(Map 3)

Phlebotomus (*Paraphlebotomus*) *jacusieli* Theodor, 1947: 95 [♂]; 1958: 20 [♀]; Theodor & Mesghali, 1964: 288; Croset, Abonnenc & Rioux, 1970: 867; Artemiev, 1974: 158, 161; Artemiev & Dergacheva, 1978: 84 [old records of '*mongolensis*' from Transcaucasia wrong, and refer to *jacusieli* which occurs at Agdam in Azerbayzhan]. Holotype ♂, ISRAEL (BMNH).

DISTRIBUTION. **Iran**: Theodor & Mesghali (1964: 288); Nadim *et al.* (1977: 215). **Israel**: Theodor (1947: 95, Rosh Pinna). **Turkey**: Yasarol (1980). **U.S.S.R.**: Artemiev (1974: 160); Artemiev & Dergacheva (1978: 87).

Phlebotomus* (*Paraphlebotomus*) *kazeruni Theodor & Mesghali

(Map 3)

Phlebotomus (*Paraphlebotomus*) *kazeruni* Theodor & Mesghali, 1964: 289 [♂ (♀ = *sergenti*)]; Nadim & Mesghali, 1968: 239 [♀]; Croset, Abonnenc & Rioux, 1970: 867; Artemiev, 1974: 158; 1978: 17; Lewis & Büttiker, 1980. Holotype ♂, IRAN (IPH, Tehran).

♀ (*extra fact*, Saudi Arabia). Leg formula 100, 117, 72; 100, 135, 72; 118, 175, 103.

DISTRIBUTION. **Afghanistan**: Artemiev (1974: 157, map). **Iran**: Nadim & Mesghali (1968: 240, map); Theodor & Mesghali (1964: 289, Kazerun). **Saudi Arabia**: Lewis & Büttiker (1980, map).

NOTE. In Afghanistan *P. kazeruni* occurs mainly in deserts and low rocky mountains (Artemiev, 1978: 17). In Saudi Arabia it seems common enough to play a part in transmitting *Leishmania* among rodents.

Phlebotomus* (*Paraphlebotomus*) *marismortui Theodor

(Map 4)

Phlebotomus (*Paraphlebotomus*) *maris-mortui* Theodor, 1947: 92 [♀ ♂]; 1958: 21. Syntypes 4 ♀, 1 ♂, ISRAEL (BMNH).

The spelling is emended according to ICZN (1964) Articles 26 (a) and 32.

Phlebotomus* (*Paraphlebotomus*) *mongolensis Sinton

(Map 4)

Phlebotomus 'C'; Young & Hertig, 1926: 611. CHINA (5 ♀, 6 ♂ in BMNH). [Synonymized by Patton & Hindle, 1926: 405.]

Phlebotomus sergenti var.; Patton & Hindle, 1926: 408 [♀ ♂]. CHINA (1 ♀ in BMNH). [Synonymized by Theodor & Mesghali, 1964: 290.]

Phlebotomus sergenti var. *mongolensis* Sinton, 1928: 309 [♂]; Raynal, 1937: 53 [♀ ♂, first full description]. Type(s), CHINA: North.

Phlebotomus (*Paraphlebotomus*) *mongolensis* Sinton; Theodor, 1958: 21; Theodor & Mesghali, 1964: 290 [synonymy]; Perfil'ev, 1968: 63, 67, 72–74, 246; Croset, Abonnenc & Rioux, 1970: 864; Artemiev, 1974: 159; 1978: 18.

Phlebotomus (*Paraphlebotomus*) *imitabilis* Artemiev, 1974: 158. Syntypes 2 ♀, 2 ♂, AFGHANISTAN: 16 km north of Kabul (MI, Moscow). [Synonymized by Artemiev, 1978: 18.]

The reference to *sergenti* var. under *P. alexandri* is relevant.

♀ (*extra fact*, China, 7.ix.1927). Leg formula 100, 114, 68; 100, 131, 77; 124, 169, 97.

DISTRIBUTION. **Afghanistan**: Artemiev (1974: 157, as *imitabilis*; 1978: 18). **China**: Beijing area (1916 or before, *R. A. B.*); Patton & Hindle (1926: 409, Xuzhou, = Hsu-chowfu); Raynal (1937: 58, Beijing and Nanjing); Wang *et al.* (1963, Gansu Province desert area); Young & Hertig (1926: 611). **Iran**: Mesghali (1961: 33, map); Nadim *et al.* (1977: 215); Theodor & Mesghali (1964: 291). **Mongolia**: Artemiev (1978: 18, Bayan-Khongorsk, central and southern Gobi, and Tsagan-Bogdo which is 42°50′N, 50°50′E). **U.S.S.R.**: Artemiev (1978: 18, Kazakhstan); Dergacheva (1974: 1668, Karshinskaya steppe); Dergacheva & Turzhanova (1977, Mangyshlak Peninsula); Dergacheva & Zerikhina (1974: 424); Sorokin (1978, lower River Emba). Many early records are omitted owing to identification problems.

NOTE. This species seems to be a poor vector (Adler, 1964: 81; Garnham, 1974: 225; Molyneux, 1977: 48; Saf'yanova, 1967: 10) of *Le. donovani*, but was stated by Sergiev (1979: 208) to be a main vector of VL in Central Asia and Kazakhstan. It plays a major part in disseminating *Le. t. major* in the U.S.S.R. (Dubrovsky, 1976: 275; Lewis, 1977: 134; Sergiev, 1979: 199) where it transmits the infection among rodents (Bray, 1972: 40; Fischer, 1978: 102). It was found infected with flagellates in gerbil burrows in Iran (Nadim & Rashti, 1971: 100).

Phlebotomus* (*Paraphlebotomus*) *nuri Lewis

(Map 4)

Phlebotomus (*Paraphlebotomus*) *nuri* Lewis, 1967: 15 [♂]; 1978*b*: 236; Artemiev, 1974: 160, 161; 1978: 17 [♀]. Holotype ♂, PAKISTAN (BMNH) [examined].

♂ (*extra fact*, Pakistan, Said Pur, 6.vi.1959). Leg formula 100, 137, 89; 94, 162, 99; 111, 196, 119 (0·83).

DISTRIBUTION. **Southern Afghanistan and southern Iran**: Artemiev (1978: 17). **Pakistan**: Lewis (1978*b*: 325, map).

NOTE. In Afghanistan *P. nuri* occurs rarely in southern rocky mountains (Artemiev, 1978: 18).

Phlebotomus* (*Paraphlebotomus*) *saevus Parrot

(Map 4)

Phlebotomus sergenti var. *saevus* Parrot & Martin, 1939: 484 [♀ ♂]. Syntypes 5 ♀, 1 ♂, Ethiopia (one in IP, Algiers; Abonnenc, 1972: 103).
Phlebotomus (*Paraphlebotomus*) *saevus* Parrot & Martin; Büttiker & Lewis, 1980 [synonymy].

♀ (*extra fact*, Saudi Arabia, Wadi Mizbil, 4.vii.1977). Leg formula 100, 127, 84; 93, 145, 86; 110, 175, 103 (0·95).

Distribution. **Africa**: Abonnenc (1972: 256, map). **Ethiopia**: Ashford (1974: 607). **Kenya**: Minter (1964: 207, map). **Saudi Arabia**: Lewis & Büttiker (1980).

Phlebotomus* (*Paraphlebotomus*) *sergenti Parrot

Phlebotomus sergenti Parrot, 1917: 564.

Represented by two subspecies.

Phlebotomus* (*Paraphlebotomus*) *sergenti sergenti Parrot

(Map 4)

Phlebotomus sergenti Parrot, 1917: 564 [♂]; França, 1918: 731 [♀]; Khodukin, 1929: 92; Patton & Evans, 1929: 195, 227; Isaev, 1935: 103 [cibarium]; Abonnenc & Larivière, 1957 [larva]; Ashford, 1964: 607 [great variation in antenna 3 may indicate two species]; Guevara-Benîtez, Ubeda-Ontiveros & Morillas-Marquez, 1978: 825, 833. Syntypes ♂, Algeria (one in IP, Algiers; Abonnenc, 1972: 105).
? *Phlebotomus crimicus* Shtefko & Minkevich, 1923: 52; Nasonov, 1926: 54 [original depository unknown, description poor, may be *P. sergenti*]; Perfil'ev, 1968: 253. Syntypes 1 ♀, 1 ♂, U.S.S.R. (MH, Simferopol?). [Position doubtful.]
[*Phlebotomus caucasicus* Marzinowsky; Popov, 1925: 90. Misidentification according to Marzinowsky & Shchurenkova, 1929: 672.]
Phlebotomus (*Phlebotomus*) *sergenti* Parrot; Abonnenc & Larivière, 1957: 395; Abonnenc, 1972: 105 [table of differences of ♀ and ♂ from *P. alexandri* and *P. saevus*].
Phlebotomus (*Paraphlebotomus*) *sergenti* Parrot; Perfil'ev, 1968: 8, 9, 49 [larva], 50, 60 [egg], 67, 72–74, 81, 236; Croset, 1961: 281; Rioux & Golvan, 1969: 72; Biocca, Coluzzi & Constantini, 1977*b*: 162; Lewis, 1978*b*: 236 [synonymy]; Artemiev, 1978: 16; Croset, Rioux, Maistre & Bayar, 1978: 731, 732.
Phlebotomus (*Paraphlebotomus*) *sergenti sergenti* Parrot; Lewis & Büttiker, 1980: 263 [synonymy].

♀ (*extra fact*, U.S.S.R., Akhsunskiyi, 1966). Leg formula 100, 119, 76; 97, 137, 80; 116, 168, 103 (0·94).

Distribution. **West of Old World**: Croset (1969: 283, map). **Africa, Mediterranean area etc.**: Abonnenc (1972: 256, map). **Orient**: Lewis (1978*b*: 325, map). **Afghanistan**: Arsenieva & Neronov (1978: 32); Artemiev (1974: 157, map); Nadim *et al.* (1979: 33, Robatak). **Algeria**: Dedet (1979, map in *litt.*); Dedet & Addadi (1977: 86); Dedet *et al.* (1977: 256). **Crete**: Hadjinicolaou (1958: 974, 975); Hertig (1949*a*: 782, 787–789). **Egypt**: Sharqiya Division (1967, *M. A. R.*); Theodor (1947: 91, Maadi). **France**: Rioux & Golvan (1969: 82). **Greece**: Hadjinicolaou (1958: 968, 970–973); Hertig (1949*a*: 779, 781); Léger *et al.* (1979: 17). **Iran**: Lewis *et al.* (1961: 206); Mesghali (1961: 33, map); Nadim, Mesghali & Javadian (1977: 215); Theodor & Mesghali (1964: 291, rare in south). **Iraq**: Ahmad (1976: 86, 98); Pringle (1953: 723, map). **Israel**: Theodor (1947: 91). **Italy**: Biocca *et al.* (1977*a*: 161, map; 1977*b*: 20, 29, map). **Jordan**: Awajan (32°02′N, 36°04′E, 20.x.1978, *E. K. S.*). **Lebanon**: Theodor (1947: 91). **Libya**: Ashford *et al.* (1977: 266, Bir Ayyad area). **Mali**: Ranque *et al.* (1975, few near Bamako). **Portugal**: França (1918: 731). **Saudi Arabia**: Lewis & Büttiker (1980, map). **Somali Republic**: Ranque *et al.* (1975: 4, 1600 m). **Southern Yemen**: Pringle (1960: 19). **Spain**: Gil Collado (1977: 186, map); Guevara-Benîtez *et al.* (1978: 814); Najera (1937: 1489); Zariquiey (1944: 19). **Syria**: 'Khan el Solol' (1970, caves, wells and pits, *K. Z. D.*); Theodor (1947: 91, Damascus). **Tunisia**: Chadli, Dancescu *et al.* (1970: 364); Chadli, Romain *et al.* (1970: 358); Croset (1969: 281, map); Croset *et al.* (1978: 735, map). **Turkey**: Houin *et al.* (1971: 635); Yasarol (1980). **U.S.S.R.**: Gaibov (1975*a*: 55; 1975*b*, Fergan area; 1976: 491, Surkhandar'ya area); Karapet'yan & Babayants (1979: 67, Bayram Ali). **Yemen**: Lewis (1974); Büttiker & Lewis (1979: 370). **Yugoslavia**: Simić & Živković (1956: 383, Makedonija).

Note. *P. sergenti* is less sensitive to temperature than *P. papatasi* and can stand colder winters and extends further north (Perfil'ev, 1968: 80). In Tunisia (Croset *et al.*, 1978: 734) it is common both in houses and out of doors, unlike *P. papatasi*. In Afghanistan (Artemiev, 1978: 17) it is moderately thermophilic and hydrophilic and bites man readily, usually indoors, and in many areas is the main vector of *Le. t. tropica* in numerous villages and towns. In the U.S.S.R. it is the main vector of anthroponotic CL (Sergiev, 1979: 206). It transmits CL in Crete (Molyneux, 1977: 49), is probably the vector of *Le. t. tropica* in Iran (Nadim & Rashti, 1971: 102; Nadim *et al.*, 1977) and Yugoslavia (Lupascu *et al.*, 1977: 192), and is the main vector in Iraq (Baghdad) and India (Abonnenc, 1972: 108).

Phlebotomus (Paraphlebotomus) sergenti similis Perfil'ev

(Map 4)

Phlebotomus (Paraphlebotomus) sergenti similis Perfil'ev, 1963: 75 [♀ ♂]; 1968: 239, 251, 252. Syntypes ♀, ♂, U.S.S.R. (ZI, Leningrad?).

The spermathecae are said to be usually larger than those of *P. s. sergenti*. The status of this form needs to be reexamined in view of Perfil'ev's (1968: viii & 17) remarks on subspecies.

DISTRIBUTION. **U.S.S.R.**: Dzhavadov *et al.* (1978: 143, Dzhalilabad and Tazakent, in Azerbaydzhan); Perfil'ev (1963: Caucasus, Pyatagorsk, southern Crimea and southern Ukraine).

Subgenus ***SYNPHLEBOTOMUS*** Theodor

Phlebotomus subgenus *Synphlebotomus* Theodor, 1948: 97; 1958: 22; Perfil'ev, 1968: 66; Lewis & Ledger, 1976: 406; Lewis, 1978*b*: 236. Type-species: *Phlebotomus martini* Parrot, 1936, by original designation.

Key to the species of subgenus *Synphlebotomus*

Females

1 Ventral plates of pharynx with coarse teeth which obscure most of dorsal spiculate armature. Ascoid on antenna 3 about 0·3 length of segment. India, Iran . . . . **eleanorae** (p. 149)
– Ventral plates of pharynx with armature which does not obscure most of dorsal spiculate armature 2
2 Spermatheca with 12 segments. Iran . . . . **ansarii** (p. 149)
– Spermatheca with six to 10 segments 3
3 Ascoid on antenna 4 about half length of segment. Pharynx with few non-spiculate ridges . . . . **rossi** (p. 150)
– Ascoid on antenna 4 more than 0·6 length of segment and reaching its tip 4
4 Spermatheca with six segments . . . . **grovei** (p. 149)
– Spermatheca with eight or more segments . **celiae** (p. 149), **martini** (p. 150), **vansomerenae** (p. 150)

Males

1 Coxite lobe with about 80 hairs. Iran . . . . **ansarii** (p. 149)
– Coxite lobe with about 30 hairs or less 2
2 Coxite lobe with about 30 filiform hairs of unequal lengths which increase from base of lobe to apex, the four apical hairs being distinctly longer than the others . . . . **katangensis** (p. 149)
– Coxite lobe with not more than 20 hairs 3
3 Coxite lobe with four or five postero-dorsal stout hairs which, in normal curved position, are 1·4 length of style; about nine postero-ventral short narrow ones present. Paramere with long dorsal row of stout sinuous hairs . . . . **rossi** (p. 150)
– Coxite lobe with longest hairs same length as style or less 4
4 Coxite lobe small and bearing about 10 subequal hairs. India, Iran . . . . **eleanorae** (p. 149)
– Coxite lobe bearing 15–22 subequal hairs 5
5 Coxite lobe with longest hairs same length as style. Paramere with a few short nearly straight rather thick hairs near tip . . . . **grovei** (p. 149)
– Coxite lobe with longest hairs 0·8 length of style or less 6
6 Coxite lobe with seven flat spatulate hairs and some thin ones . . . . **celiae** (p. 149)
– Coxite lobe without spatulate hairs 7
7 Coxite lobe with six flat hairs and about 12 thin shorter ones . . . . **martini** (p. 150)
– Coxite lobe with 10 flat hairs ending in filiform points, and some thin ones . **vansomerenae** (p. 150)

Phlebotomus* (*Synphlebotomus*) *ansarii Lewis

(Map 5)

Phlebotomus (*Phlebotomus*) *ansarii* Lewis, 1957: 689 [♀ ♂]. Holotype ♂, IRAN (BMNH) [examined].
Phlebotomus (*Synphlebotomus*) *ansarii* Lewis; Theodor, 1958: 22; Mesghali, 1961: 37; Lewis & Ledger, 1976: 406; Artemiev, 1978: 25.

♂ (*extra fact*). Leg formula 100, 112, 66; 106, 135, 76; 122, 169, 93 (1·67, 0·62).

DISTRIBUTION. **Iran**: Mesghali (1961: 56, map); Theodor & Mesghali (1964: 291).

NOTE. *P. ansarii* has been found infected with flagellates in gerbil burrows in Iran (Nadim & Rashti, 1971: 100) where it is involved in the transmission of zoonotic CL (Bray, 1972: 40).

Phlebotomus* (*Synphlebotomus*) *celiae Minter

(Map 5)

Phlebotomus (*Phlebotomus*) *celiae* Minter, 1962: 457 [♀ ♂]; Abonnenc & Minter, 1965: 32; Abonnenc, 1972: 110. Holotype ♂, KENYA (BMNH) [examined].
Phlebotomus (*Synphlebotomus*) *celiae* Minter; Lewis & Ledger, 1976: 406.

♀ (*extra fact*). Leg formula 100, 106, 65; 104, 127, 76; 122, 162, 94 (1·87, 0·67).

NOTE. *P. celiae* transmits VL in Kenya (Lysenko, 1971: 517; Mutinga, 1975: 340; Perfil'ev, 1968: 142). It and *P. vansomerenae* are indistinguishable from *P. martini* in the female sex, so their roles are not fully known.

Phlebotomus* (*Synphlebotomus*) *eleanorae Sinton

(Map 5)

Phlebotomus eleanorae Sinton, 1931*a*: 817 [♂]; 1933: 418. Holotype ♂, INDIA (BMNH) [examined].
Phlebotomus (*Synphlebotomus*) *eleanorae* Sinton; Mesghali, 1965: 267 [♀]; Lewis & Ledger, 1976: 405; Lewis, 1978*b*: 217 [synonymy]; Artemiev, 1978: 25.

♂ (*extra fact*, holotype). Leg formula 100, 106, 64; 110, 140, 78; 126, 172, 94 (1·68, 0·60).

DISTRIBUTION. **India**: Sinton (1931: 817). **Iran**: Mesghali (1935: 269).

Phlebotomus* (*Synphlebotomus*) *grovei Downes

(Map 5)

Phlebotomus (*Synphlebotomus*) *grovei* Downes, 1971: 283; [♀ ♂]; Lewis & Ledger, 1976: 406. Holotype ♂, NAMIBIA (SAIMR, Johannesburg).

♀ (*extra fact*). Leg formula 100, 105, 71, – – –, 123, 167, 100 (0·69).

DISTRIBUTION. **Namibia**: Ledger (1977: 58, map).

Phlebotomus* (*Synphlebotomus*) *katangensis Bequaert & Walravens

(Map 5)

Phlebotomus katangensis Bequaert & Walravens, 1930: 35 [♂]. Syntypes 2 ♂, ZAIRE: Lubumbashi (= Elizabethville) (MRAC, Tervuren).
Phlebotomus (*Synphlebotomus*) *katangensis* Bequaert & Walravens; Lewis & Ledger, 1976: 407 [synonymy & citations].

P. rossi was treated as a synonym of *P. katangensis* by some authors for several years.

Phlebotomus* (*Synphlebotomus*) *martini Parrot

(Map 5)

Phlebotomus (*Phlebotomus*) *martini* Parrot, 1936: 35 [♀ ♂]. Syntypes 9♀, 2 ♂, ETHIOPIA (one in IP, Algiers; Abonnenc, 1972: 117).

Phlebotomus (*Synphlebotomus*) *martini* Parrot; Lewis & Ledger, 1976: 406 [synonymy].

♀ (*extra fact*, Kenya). Leg formula 100, 116, 72; 102, 135, 75; 117, 157, 84 (0·68).

DISTRIBUTION. **Africa**: Abonnenc (1972: 117). **Kenya**: Kangondi (termite hill record from *D. M. M.*, 1980); Minter (1964: 207, map); Wijers & Ngoka (1974: 26). **Sudan**: Lewis & Kirk (1954: 35, map); Qutubuddin (1962: 594). **Uganda**: Wykoff *et al.* (1969).

NOTE. The work of Minter and colleagues showed that *P. martini* transmits VL in Kenya (Adler, 1964: 87; Bray, 1972: 40; Diesfeld, 1978: 50; Manson-Bahr, 1971: 434; Perfil'ev, 1968: 142; Southgate, 1977: 245; Wilcocks & Manson-Bahr, 1972: 122). It is uncommon in western Tharaka but may be the vector there (Mutinga & Ngoka, 1975; Wijers & Ngoka, 1974: 29). It may transmit the disease in south-west Ethiopia (Fuller *et al.*, 1979: 429).

Phlebotomus* (*Synphlebotomus*) *rossi De Meillon & Lavoipierre

(Map 5)

Phlebotomus rossi De Meillon & Lavoipierre, 1944: 44 [♂]; Parrot, 1957: 49 [proposed as synonym of *P. katangensis*]. Holotype ♂, ZIMBABWE (SAIMR, Johannesburg).

Phlebotomus (*Phlebotomus*) *rossi* De Meillon & Lavoipierre; Minter, 1962: 459; Abonnenc, 1967: 4; 1972: 112.

Phlebotomus (*Synphlebotomus*) *rossi* De Meillon & Lavoipierre; Mesghali, 1965: 269; Downes, 1971: 284; Lewis & Ledger, 1976: 407 [♀, reinstated as species; synonymy]; Ledger, 1977: 578.

♀ (*extra fact*, Namibia, Sandmodder, 18.iv.1975). Leg formula 100, 113, 66; 105, 137, 75; 120, 170, 93 (2·39, 0·28).

DISTRIBUTION. **Southern Africa**: Lewis & Ledger (1976: 410). **Namibia**: Ledger (1977: 582, map).

NOTE. In Namibia *P. rossi* lives in damp hyrax burrows and has been found infected with flagellates in an area of CL (Ledger, 1977: 579).

Phlebotomus* (*Synphlebotomus*) *vansomerenae Heisch, Guggisberg & Teesdale

(Map 5)

Phlebotomus (*Phlebotomus*) *vansomerenae* Heisch, Guggisberg & Teesdale, 1956: 211 [♀ ♂]. Holotype ♀, KENYA (BMNH) [examined].

Phlebotomus (*Synphlebotomus*) *vansomerenae* Heisch, Guggisberg & Teesdale; Lewis & Ledger, 1976: 406 [synonymy].

DISTRIBUTION. **Kenya**: Minter (1964: 207); Wijers & Ngoka (1974: 26).

NOTE. This species may transmit kala-azar in western Tharaka (Wijers & Ngoka, 1974: 28).

Subgenus *LARROUSSIUS* Nitzulescu

Phlebotomus subgenus *Larroussius* Nitzulescu, 1931: 274; Theodor, 1948: 97; 1958: 22; Perfil'ev, 1968: 63, 73, 82, 250, 252; Lewis, Minter & Ashford, 1974: 435; Biocca, Coluzzi & Constantini, 1977: 162 [trochanter spines in two groups in four species]; Lewis, 1978*b*: 237; Artemiev, 1980: 1181. Type-species: *Phlebotomus major* Annandale, 1910, by original designation.

Key to the species and subspecies of subgenus *Larroussius*

Females

1 Spermatheca with indistinct segmentation and no neck. Pharynx with large irregular teeth . 2
– Spermatheca with distinct segmentation and neck. Pharynx with punctiform teeth 3
2 Palpal segments 2 and 3 each 0·18–0·20 mm long . . . . . . ***mascittii mascittii*** (p. 158)

–	Palpal segments 2 and 3 each 0·22–0·24 mm long	***mascittii canaaniticus*** (p. 158)
3	Spermatheca with neck about as long as head	***somaliensis*** (p. 162)
–	Spermatheca with neck much longer than head	4
4	Spermathecal ducts bag-like for most of their length	***gibiensis*** (p. 154)
–	Spermathecal ducts mainly tubular	5
5	Pharyngeal teeth not very fine, in regular transverse rows, occupying nearly half the pharynx. Spermatheca with about 15 segments. Iran and Turkestan	***wenyoni*** (p. 163)
–	Pharyngeal teeth very fine and punctiform	6
6	Spermatheca very long with 30–35 segments. Pharyngeal teeth bigger in middle than at sides	***kandelakii burneyi*** (p. 154), ***kandelakii kandelakii*** (p. 154)
–	Spermatheca with 8–22 segments	7
7	Spermatheca with 18–22 segments	8
–	Spermatheca with 8–16 segments	9
8	Spermatheca with about 22 segments, long neck and a very small head. Pharynx with scarcely visible spicules. West Malaysia	***betisi*** (p. 153)
–	Spermatheca with 18–21 segments, broad at end and narrowing towards base, end process (neck and head) relatively short, about three times as long as wide. Hind half of pharynx with fine punctiform teeth which become scale-like anteriorly	***keshishiani*** (p. 155)
9	Outer 0·43 of spermathecal ducts sac-like. Pharyngeal armature occupying 0·15–0·17 length of pharynx. Antenna 3 = 0·38–0·42 mm long	***ariasi*** (p. 153)
–	Spermathecal ducts not like this	10
10	Wing length usually 1·8–2·5 mm	11
–	Wing length usually 2·8–3·6 mm	13
11	Spermatheca with 10 (8–12) segments	***longicuspis*** (p. 155), ***orientalis*** (p. 159), ***perniciosus*** (p. 161)
–	Spermatheca with 12–16 segments	12
12	Palpal formula 1, 4, 2, 3, 5	***perfiliewi perfiliewi*** (p. 160), ***perfiliewi transcaucasicus*** (p. 161)
–	Palpal formula 1, 2, 4, 3, 5	***tobbi*** (p. 162)
13	Armature occupying half length of pharynx	***major krimensis*** (p. 156)
–	Armature occupying about a third to a quarter length of pharynx	14
14	Armature occupying about hind third or more of pharynx, fore teeth scale-like with secondary spicules	15
–	Armature occupying about hind quarter of pharynx	17
15	Armature occupying hind third of pharynx. Palpal formula 1, 4, (2, 3), 5	***major major*** (p. 157)
–	Armature of pharynx extending further forward. Palpal formula 1, 4, 2, 3, 5	16
16	Wing about 3·5 mm long	***major neglectus*** (p. 157)
–	Wing about 2 mm long	***major syriacus*** (p. 157)
17	Hind teeth of pharyngeal armature relatively large	***guggisbergi*** (p. 154)
–	Hind teeth of pharyngeal armature not relatively large	18
18	Most of pharyngeal armature comprising rows of fused denticles	***smirnovi*** (p. 162)
–	Most of pharyngeal armature comprising distinct denticles	***aculeatus*** (p. 153), ***longipes*** (p. 156), ***pedifer*** (p. 159)

Males

1	Aedeagus with distal long slightly-curved transparent process bearing fine dorsal teeth	2
–	Aedeagus otherwise	4
2	Transparent part of aedeagus narrow and nearly straight, aedeagus 0·16 mm long	***perfiliewi transcaucasicus*** (p. 161)
–	Transparent part of aedeagus narrow and curved, or broad	3
3	Two ascoids on antenna 3–15. Aedeagus 0·13–0·14 mm long, transparent process short and wide with four or five teeth concentrated near tip	***perfiliewi perfiliewi*** (p. 160)
–	Two ascoids on antenna 3–15. Aedeagus 0·17–0·19 mm long, transparent process long and narrow with teeth evenly spread	***perfiliewi galilaeus*** (p. 160)
4	Aedeagus with ventral teeth in the middle, and narrowing gradually to a point	5
–	Aedeagus with smooth sides and no ventral teeth	6
5	Two ascoids on antenna 3–5	***kandelakii kandelakii*** (p. 154)
–	Two ascoids on antenna 3–7	***kandelakii burneyi*** (p. 154)
6	Aedeagus with rounded end	7
–	Aedeagus with sharp tip and nearly parallel sides	18

7 Aedeagus with marked distal bulge thickest at 0·84, distinctly shorter than paramere, with sperm tubes emerging at tip . . . 8

– Aedeagus with bulge nearer base or with none or virtually none . . . 9

8 Coxite 0·33 mm long, 1·9 length of aedeagus, with 16–32 hairs in tuft. Aedeagus clapper-like, with moderate subapical expansion . . . ***ariasi*** (p. 153)

– Coxite 0·48 mm long, three times length of aedeagus, with 37–78 hairs in group. Aedeagus sword-like, with thick subapical expansion and nearly pointed tip . . . ***chadlii*** (p. 153)

9 Aedeagus gradually thickening from each end till 0·6. Afrotropical . . . ***gibiensis*** (p. 154)

– Aedeagus without marked local thickening . . . 10

10 Length of aedeagus 7·8–11·0 middle thickness . . . 11

– Length of aedeagus 13–26 middle thickness . . . 14

11 Coxite about 6·9 as long as thick. Afrotropical . . . ***fantalensis*** (p. 154)

– Coxite about 4·6 or less as long as thick. Palaearctic . . . 12

12 Paramere with inconspicuous mid-ventral row of about four spines . . . ***smirnovi*** (p. 162)

– Paramere with conspicuous mid-ventral row of about ten spines . . . 13

13 Style rather longer than half length of coxite. Surstyle longer than coxite. Antenna 3 = 0·45 mm long, 1·55 length of labrum . . . ***mascittii mascittii*** (p. 158)

– Style less than half length of coxite. Surstyle not longer than coxite. Antenna 3 = 0·37–0·40 mm long, 1·3–1·5 length of labrum . . . ***mascittii canaaniticus*** (p. 158)

14 Aedeagus clearly shorter than paramere, sperm tubes emerging from tip . . . 15

– Aedeagus nearly as long as paramere, sperm tubes emerging before tip.
Two ascoids on antenna 3–8 . . . 16

15 Aedeagus narrowing towards tip. Coxite hair-group with 18–30 hairs.
Sperm tubes 6–11 times length of pump. . . . ***keshishiani*** (p. 155)

– Aedeagus with scarcely visible subapical swelling. Coxite hair-group with 25–30 hairs ***mariae*** (p. 158)

16 Teeth occupying nearly half length of pharynx, relatively large and in regular transverse rows ***wenyoni*** (p. 163)

– Teeth occupying only a third of length of pharynx, fine and punctiform.
Tip of aedeagus like drum-stick . . . 17

17 Coxite 0·33–0·35 mm long, style 0·16–0·19 mm long . . . ***major neglectus*** (p. 157)

– Coxite 0·40–0·45 mm long, style 0·20–0·22 mm long . . . 18

18 Palpal formula 1, 4, (2, 3), 5 . . . ***major major*** (p. 157)

– Palpal formula 1, 4, 2, 3, 5 . . . 19

19 Coxite hair-group with more than 20 widely spaced hairs. Style less than half length of coxite ***major krimensis*** (p. 156)

– Coxite hair-group with about 30 densely packed hairs. Style half as long as coxite ***major syriacus*** (p. 157)

20 Aedeagus bifid . . . 21

– Aedeagus not bifid . . . 22

21 Both points of aedeagus the same size and sharp. Sperm pump 0·14–0·15 mm long ***perniciosus*** (p. 161)

– Distal point of aedeagus distinctly longer than the other and rounded. Sperm pump 0·05–0·18 mm long.
Both middle spines of style nearer basal spine than in *perniciosus*. Style longer than coxite. Aedeagus narrowing more markedly from the base, and more conical . . . ***tobbi*** (p. 162)

22 Hair group of coxite on low pad . . . ***guggisbergi*** (p. 154)

– Hair group of coxite not on pad . . . 23

23 Aedeagus with one to three subterminal spicules . . . ***aculeatus*** (p. 153)

– Aedeagus without subterminal spicules . . . 24

24 Tip of aedeagus tapering gradually, far from that of paramere except in *P. longicuspis* . . . 25

– Tip of aedeagus tapering abruptly, near that of paramere . . . 27

25 Tip of aedeagus curving downward. North Africa . . . ***longicuspis*** (p. 155)

– Tip of aedeagus curving upward. North-east tropical Africa . . . 26

26 Tip of aedeagus curving slightly upward . . . ***longipes*** (p. 156)

– Tip of aedeagus curving sharply upward . . . ***pedifer*** (p. 159)

27 Antenna 3–12 with two ascoids. Tip of aedeagus ventral and mesad . . . ***langeroni*** (p. 155)

– Antenna 3–7 with two ascoids. Tip of aedeagus dorsal and laterad . . . ***orientalis*** (p. 159)

Phlebotomus* (*Larroussius*) *aculeatus Lewis, Minter & Ashford

(Map 6)

Phlebotomus species C; Ashford, 1974: 610 [♀].
Phlebotomus (*Larroussius*) *aculeatus* Lewis, Minter & Ashford, 1974: 437 [♀ ♂; differences between Ethiopian and Kenyan forms noted]. Holotype ♂, KENYA (BMNH) [examined].
Phlebotomus (*Larroussius*) *elgonensis* Ngoka, Madel & Mutinga, 1975: 132. Holotype ♂, KENYA (NM, Nairobi). **Syn. n.**

NOTE. The descriptions of *aculeatus* and *elgonensis* tally fairly well but there are a few discrepancies in the description of the latter. The palp formulae of both sexes do not agree with the lengths of segments given; and in the paratype male, which the authors kindly placed in the BMNH, there are two ascoids on antenna 3–7 only, and $R_2/_{2+3}$ is 2·3 and not 0·88. The two appear to be the same species.

DISTRIBUTION. **Ethiopia and Kenya**: Lewis *et al.* (1974: 439). **Kenya**: Ngoka *et al.* (1975: 132, 136, three caves cited for holotype of *P. elgonensis*).

Phlebotomus* (*Larroussius*) *ariasi Tonnoir

(Map 6)

Phlebotomus ariasi Tonnoir, 1921*b*: 53 [♂]; Nitzulescu, 1930*d*: 531; Raynal & Le Gac, 1933: 652 [♀; Parrot, 1934: 386; 1936: 48; Najera, 1936: 309; Zariquiey, 1937: 410; Rageau & Colas-Belcour, 1956: 235; Abonnenc & Larivière, 1957: 392 [larva]; Rioux, Abonnenc & Bauduoy, 1965: 615; Croset, 1969: 349; Bailly-Choumara, Abonnenc & Pastre, 1971: 436; Biocca, Coluzzi & Constantini, 1977*a*: 162; Croset, Rioux, Maistre & Bayar, 1978: 734; Guevara-Benîtez, Ubeda-Ontiveros & Morillas-Marquez, 1978: 817, 832. Holotype ♂, SPAIN (depository unknown, believed lost).
Phlebotomus (*Larroussius*) *ariasi* Tonnoir; Theodor, 1958: 23; Juminer & Gibily, 1966: 86; Rioux & Golvan, 1969: 22, 88 [review]; Dedet & Dib, 1972: 56; Rioux, Croset, Léger & Benmansur, 1974: 96; Rioux, Croset, Léger, Benmansur & Soussi, 1975: 499; Biocca, Coluzzi & Constantini, 1977*a*: 160–162; 1977*b*: 30; Croset, Rioux, Maistre & Bayar, 1978: 734.

♀. Leg formula, after Zariquiey. 100, 133, 86; 138, 149, 104; 107, 183, 116 (0·98).

DISTRIBUTION. **Western Mediterranean**: Croset (1969: 357, map); Rioux & Golvan (1969: 89, 99, map). **Algeria**: Dedet (1979, map in *litt.*); Dedet & Addadi (1977: 86); Dedet, Addadi & Lannuzel (1977: 256); Parrot (1936: 48); Parrot & Clastrier (1939: 633). **France**: Croset (1969: 353, map); Dedet & Dib (1973: 55, 57–61, map); Houin *et al.* (1977: 113, map, 114, Juigné-sur-Sarthe, 47°52′N, 0°17′W); Rioux & Golvan (1969: 51, 89, 100, map). **Italy**: Biocca *et al.* (1977*a*: 160, map; 1977*b*: 20, 28, map); Rioux *et al.* (1964: 966). **Morocco**: Bailly-Choumara *et al.* (1971: 453, map). **Portugal**: Meira & Ferreira (1944: 274, map). **Spain**: Gil Collado (1977: 186, map); Guevara-Benîtez *et al.* (1978: 815); Najera (1937: 1488); Rioux & Golvan (1969: 100, map); Zariquiey (1944: 19). **Tunisia**: Croset (1969: 355, map); Croset *et al.* (1966: 549, map; 1978: 733, map); Rioux *et al.* (1966: 88, map, rare in humid areas; 1974: 505, map).

NOTE. *P. ariasi* has been readily infected with the parasites of VL (Molyneux, 1977: 48) and is the vector of *Le. donovani* in the south of France (Killick-Kendrick, 1978: 301; Lanotte *et al.*, 1977: 126; Molyneux, 1977: 48; Rioux *et al.*, 1977: 299, 303; Zuckerman & Lainson, 1977: 73).

Phlebotomus* (*Larroussius*) *betisi Lewis & Wharton

(Map 6)

Phlebotomus (*Larroussius*) *betisi* Lewis & Wharton, 1963: 117 [♀]; Lewis, 1978*b*: 237. Holotype ♀, WEST MALAYSIA (BMNH) [examined].

DISTRIBUTION. **West Malaysia**: (Lewis, 1978*b*: 237, map).

Phlebotomus* (*Larroussius*) *chadlii Rioux, Juminer & Gibily

(Map 6)

Phlebotomus (*Larroussius*) *chadlii* Rioux, Juminer & Gibily, 1966: 83 [♂]; Croset, Rioux, Juminer & Tour, 1966: 547; Croset, 1969: 342; Rioux & Golvan, 1969: 96; Rioux, Guy, Corroller, Croset & Addadi, 1970:

101 [♀ unknown]; Rioux, Croset, Léger & Bailly-Choumara, 1974: 96, 97; Rioux, Croset, Léger, Benmansur & Soussi, 1975: 498; Croset, Rioux, Maistre & Bayar, 1978: 735 [♀ unknown]. Holotype, TUNISIA (EM, Montpellier).

♂. Leg formula, Tunisia, after Rioux *et al.* (1966: 85). 100, 142, 96; 88, 162, 100; 104, 200, 125 (1·20).

DISTRIBUTION. **Algeria**: Dedet (1979, in *litt.*); Dedet & Addadi (1977: 86); Dedet *et al.* (1977: 256). **Morocco**: Rioux *et al.* (1974: 99, 100; 1975: 495, map). **Tunisia**: Croset *et al.* (1978: 733, map); Dedet (1971: 157); Rioux *et al.* (1966: 83, 88, in arid areas).

Phlebotomus* (*Larroussius*) *fantalensis Lewis, Minter & Ashford

(Map 6)

Phlebotomus species B; Ashford, 1974: 610 [♂].
Phlebotomus (*Larroussius*) *fantalensis* Lewis, Minter & Ashford, 1974: 439 [♂]. Holotype ♂, ETHIOPIA (BMNH) [examined].

Phlebotomus* (*Larroussius*) *gibiensis Lewis, Minter & Ashford

(Map 6)

Phlebotomus species A; Ashford, 1974: 610.
Phlebotomus (*Larroussius*) *gibiensis* Lewis, Minter & Ashford, 1974: 439 [♀ ♂]. Holotype ♂, ETHIOPIA (BMNH) [examined].

Phlebotomus* (*Larroussius*) *guggisbergi Kirk & Lewis

(Map 6)

Phlebotomus (*Synphlebotomus*) *guggisbergi* Kirk & Lewis, 1952: 339, 340 [♀ ♂]. Lectotype ♂, KENYA (BMNH), designated by Lewis, Minter & Ashford, 1974: 440 [examined].
Phlebotomus guggisbergi Kirk & Lewis; Lewis & Minter, 1960: 352.
Phlebotomus (*Phlebotomus*) *guggisbergi* Kirk & Lewis; Abonnenc & Minter, 1965: 31; Abonnenc, 1972 [in '*Synphlebotomus*' group].
Phlebotomus (*Larroussius*) *guggisbergi* Kirk & Lewis; Lewis, Minter & Ashford, 1974: 440.

DISTRIBUTION. **Kenya**: Minter (1964: 207, map; 1966: 180, map). **Tanzania**: Minter (1964: 208). **Uganda**: Kidepo Park (ix.1969, received from *D. M. M.* in 1980).

NOTE. This very large species is found in caves and among trees and bites man (Abonnenc, 1972: 112).

Phlebotomus* (*Larroussius*) *kandelakii Shchurenkova

Phlebotomus kandelakii Shchurenkova, 1929*b*: 693; Perfil'ev, 1968: 78, 261.

Phlebotomus* (*Larroussius*) *kandelakii burneyi Lewis

(Map 6)

Phlebotomus (*Larroussius*) *kandelakii burneyi* Lewis, 1967: 17 [♀ ♂]; 1978*b*: 238; Artemiev, 1974: 160. Holotype ♂, PAKISTAN (BMNH) [examined].

DISTRIBUTION. **Pakistan**: Lewis (1978*b*: 238, map).

Phlebotomus* (*Larroussius*) *kandelakii kandelakii Shchurenkova

(Map 6)

Phlebotomus sp. n.; Shchurenkova, Demina & Pavlova, 1929: 681, 684, 686, 688.
Phlebotomus kandelakii Shchurenkova, 1929*b*: 693 [♀ ♂]; Adler, Theodor & Lourie, 1930: 536. Syntypes ♀ ♂, U.S.S.R. (TI, Tbilsi).

Phlebotomus (*Larroussius*) *kandelakii* Shchurenkova; Theodor, 1958: 23; Perfil'ev, 1968: 261; Lewis, 1978: 237; Artemiev, 1978: 19.

DISTRIBUTION. **Central Asia**: Dolmatova (1962: 461, map); Dolmatova & Demina (1971: 120, map). **Afghanistan**: Artemiev (1974: 157, map; 1978: 19). **Iran**: Mesghali (1961: 47, map); Nadim & Rashti (1978: 27, Chahar Mahal); Theodor & Mesghali (1964: 291, only in north). **Lebanon**: Theodor & Mesghali (1964: 291). **Turkey**: Artemiev (1978: 19); Yasarol (1980). **U.S.S.R.**: Gaibov (1975*b*, Fergana area); Petrishcheva (1937: 148).

NOTE. In Afghanistan *P. kandelakii* is very hydrophilic and moderately thermophilic and bites man and large animals readily (Artemiev, 1978: 19). It appears to be a vector of *Le. donovani* in Georgia (Maruashvili, 1958: 595; Perfil'ev, 1968: 142), and was considered to be a main vector of VL in Transcaucasia (Sergiev, 1979: 208).

Phlebotomus* (*Larroussius*) *keshishiani Shchurenkova

(Map 6)

Phlebotomus keshishiani Shchurenkova, 1936: 892 [♀ ♂]. Syntypes ♀ ♂, U.S.S.R. (TI, Dushanbe).

Phlebotomus (*Larroussius*) *keshishiani* Shchurenkova; Theodor & Mesghali, 1964: 291 [had probably often been confused with *major* and *wenyoni*]; Lewis, 1967: 19; 1978: 238; Perfil'ev, 1968: 274; Artemiev, 1978: 19.

♂ (*extra facts*, Pakistan, Said Pur, 6.vi.1965). Leg formula 100, 161, 113; 87, 181, 118; 108, 214, 141 (2·69, 1·09); tibia 3 = 2·65 mm long.

DISTRIBUTION. **Afghanistan**: Artemiev (1974: 157, map; 1978: 15). **Iran**: Nadim & Rashti (1978: 271, general map, 277); Nadim *et al.* (1977: 215). **Pakistan**: Lewis (1978*b*: 238, map). **U.S.S.R.**: Gaibov (1975*b*, Fergana area; 1976: 49, Surkhandar'ya); Perfil'ev (1968: 277); Petrishcheva (1935: 206).

NOTE. In the U.S.S.R. this species is numerous between 1900 and 2300 m (Perfil'ev, 1968: 277), and in Afghanistan ranges from 1000 to 2800 m and will bite man (Artemiev, 1978: 19).

Phlebotomus* (*Larroussius*) *langeroni Nitzulescu

(Map 7)

Phlebotomus perniciosus var.; Nitzulescu, 1930*c*: 382 [♂].

Phlebotomus langeroni Nitzulescu, 1930*e*: 548 [♂]. Holotype ♂, TUNISIA (FM, Paris?).

Phlebotomus (*Phlebotomus*) *langeroni* Nitzulescu; Parrot, 1940: 310.

Phlebotomus (*Larroussius*) *langeroni* Nitzulescu; Theodor, 1958: 24; Perfil'ev, 1968: 77; Croset, 1969: 311 [♀ apparently unknown]; Bailly-Choumara, Abonnenc & Pastre, 1971: 437; Rioux, Croset, Léger & Bailly-Choumara, 1974: 96; Croset, Rioux, Maistre & Bayar, 1978: 735.

DISTRIBUTION. **North Africa**: Croset (1969: 313, 316, maps, evidently very rare). **Tunisia**: Chadli *et al.* (1970: 358; 1970: 363; 1978: 733, map).

NOTE. The unknown female (Theodor, 1958: 24) is probably difficult to distinguish from *P. longicuspis* and *perniciosus*. The species seems to be rare in Tunisia (Croset *et al.*, 1978: 736).

Phlebotomus* (*Larroussius*) *longicuspis Nitzulescu

(Map 7)

Phlebotomus perniciosus var.; Nitzulescu, 1930*c*: 384 [in part, one ♂].

Phlebotomus langeroni var. *longicuspis* Nitzulescu, 1930*e*: 551 [♂]; Ristorcelli, 1941: 372. Syntypes ♂, TUNISIA (FM, Paris?).

Phlebotomus longicuspis Nitzulescu; Parrot, 1936: 138 [♀] [raised to species].

Phlebotomus (*Larroussius*) *longicuspis* Nitzulescu; Perfil'ev, 1968: 77; Croset, 1969: 312; Bailly-Choumara, Abonnenc & Pastre, 1971: 436; Rioux, Croset, Léger & Bailly-Choumara, 1974: 96; Croset, Rioux, Maistre & Bayar, 1978: 736.

DISTRIBUTION. **North Africa**: Croset (1969: 321, 322, map). **Algeria**: Dedet (1979, map in *litt.*); Dedet *et al.* (1975: 185; 1977: 276). **Libya**: Ashford *et al.* (1977: 265, Bir Ayyad area, south of Surman). **Morocco**: Bailly-Choumara *et al.* (1971: 453); Rioux *et al.* (1974: 99). **Tunisia**: Chadli, Dancescu *et al.* (1970: 363); Chadli, Romain *et al.* (1970: 358); Croset *et al.* (1978: 737, map).

NOTE. This species has been found infected with *Le. d. infantum* in Algeria (Dedet, 1979: 58; Theodor, 1964: 480) and regarded as a VL vector in North Africa (Abonnenc, 1972: 34; Hoogstraal & Heyneman, 1969: 1185, 1186; Wilcocks & Manson-Bahr, 1972: 121) but in Tunisia seems too rare to be important (Croset *et al.*, 1978: 736).

***Phlebotomus* (*Larroussius*) *longipes* Parrot & Martin**

(Map 7)

Phlebotomus (*Phlebotomus*) *longipes* Parrot & Martin, 1939: 143 [♀ ♂]; Kirk & Lewis, 1946*b*: 119; 1951: 434; Parrot, 1940: 316; 1953: 113 [papillae]; Minter, 1964: 209 [variation]; Abonnenc & Minter, 1965: 32; Abonnenc, 1972: 115. Syntypes 642 ♀, 896 ♂, ETHIOPIA (one ♀, labelled 'type' in Parrot's writing, in BMNH).

Phlebotomus longipes Parrot & Martin; Kirk & Lewis, 1947: 873; Abonnenc & Larivière, 1957: 399 [larva]; Ashford, 1974: 610; Gemetchu, 1974: 114.

Phlebotomus (*Larroussius*) *longipes* Parrot & Martin; Lewis, Mutinga & Ashford, 1972: 119.

♀ (*extra fact*, Ethiopia, Addis Ababa). Leg formula 100, 129, 81; 91, 148, 89; 102, 174, 108 (3·42, 1·26); tibia 3 = 2·19 mm. The length of the legs is evidently due to the size of the insect.

DISTRIBUTION. **Africa**: Abonnenc (1972: 259, map). **Ethiopia**: Ashford (1974: 607). **Kenya**: Minter (1964: 209, map).

NOTE. This species transmits CL in Ethiopia (Ashford, 1977: 236; Schaller, 1972: 102; White, 1977: 163; Wilcocks & Manson-Bahr, 1972: 135).

***Phlebotomus* (*Larroussius*) *major* Annandale**

Phlebotomus major Annandale, 1910: 46.

Phlebotomus (*Larroussius*) *major* Annandale; Perfil'ev, 1968: vii, 7, 49 [larva], 50, 54, 62, 75, 85, 253.

Some early records of *P. major* refer to other species described later. After their recognition Theodor & Mesghali (1964: 291) referred to *P. major*, generally found in mountainous country, as an eastern Mediterranean species occurring from Italy to north-west India where it was found mainly in the western Himalayas. Perfil'ev (1968: 94, 261) discussed its distribution and doubted the truth of Central Asian records.

Theodor (1958) recognized three subspecies, *major* in India, *neglectus* in Dalmatia and Italy, and *syriacus* in the Mediterranean and Caucasus. The following are records of *P. major* s. l.

Afghanistan: Artemiev (1978: 19). **Crete**: Hadjinicolaou (1958: 974); Hertig (1949*a*: 782, 787–789). **Greece**: Hadjinicolaou (1958: 968, 970, 972, 973); Hertig (1949*a*: 779, 781–786). **India**: Theodor (1958: 25). **Iran**: Nadim *et al.* (1977: 215; 1978: 26–28, maps; Chahar Mahal and other areas without details); Theodor & Mesghali (1964: 291, few at Hamadan, Kazerun and Yazd; some early records may refer to *P. tobbi*). **Italy**: Biocca *et al.* (1977*a*: 162, map; 1977*b*: 20, 28, map). Corradetti *et al.* (1956*a*: 6, map); Puccini *et al.* (1977: 38, map). **Rumania**: Duport *et al.* (1971: 394). **Turkey**: Yasarol (1980). **U.S.S.R.**: Petrishcheva (1937: 148). **Yugoslavia**: Simić & Živković (1956: 383–385, north and south Dalmatia, Hercegovina, Istra, Kosovo i Metohija, Makedonija, Montenegro, Serbia and Vojvodina).

***Phlebotomus* (*Larroussius*) *major krimensis* Perfil'ev**

(Map 7)

Phlebotomus (*Larroussius*) *major krimensis* Perfil'ev, 1966: 282 [♀ ♂]; 1968: 226, 254, 256, 258, 259. Syntypes ♀ ♂, U.S.S.R. (ZI, Leningrad?).

? *Phlebotomus perniciosus* var. *tauricus* Nasonov, 1927: 369 [♀]. No type, U.S.S.R.: Crimea. Listed by Perfil'ev (1968: 253) under *P. major*. [Position doubtful.]

DISTRIBUTION. **U.S.S.R.**: Perfil'ev (1968: 255, 259, 261, Crimean subspecies).

NOTE. The names *tauricus* and *tauriae* (= *longiductus*) appear to have nothing to do with bulls or the Taurus Mountains but to be derived from Tauri, the name of an ancient Crimean tribe.

This form tends to remain in houses by day (Perfil'ev, 1968: 110) but not as much as *P. papatasi.*

Phlebotomus* (*Larroussius*) *major major Annandale

(Map 7)

Phlebotomus major Annandale, 1910: 46 [♂]; Summers, 1911: 110; Sinton, 1925: 107 [♀]; 1928: 303 [in part]. Lectotype ♀, INDIA (ZSI, Calcutta), designated by Quate, 1962*a*: 157.

[*Phlebotomus major* var. *perniciosus* Newstead [in part]; Brunetti, 1912: 201. Synonymized by Perfil'ev, 1968: 253.]

Phlebotomus (*Larroussius*) *major* Annandale; Theodor & Mesghali, 1964: 291; Perfil'ev, 1968: 253, 260 [in part].

Phlebotomus (*Larroussius*) *major major* Annandale; Lewis, 1978*b*: 238 [synonymy, including synonym *griseus* of which the type seems to be lost (Quate, 1962*a*: 157)].

DISTRIBUTION. **India, Nepal and Pakistan**: Lewis (1978*b*: 239).

Phlebotomus* (*Larroussius*) *major neglectus Tonnoir

(Map 7)

Phlebotomus neglectus Tonnoir, 1921*a*: 333. Syntypes 12 ♀, 3 ♂, ALBANIA, YUGOSLAVIA, ITALY (NM, Vienna).

Phlebotomus (*Larroussius*) *major neglectus* Tonnoir; Theodor, 1958: 25; Perfil'ev, 1968: 254.

DISTRIBUTION. **Albania, Italy & Yugoslavia**: Tonnoir (1921: 333). **Italy & Dalmatia**: Theodor (1958: 25).

NOTE. *P. major* is considered to be a vector of VL in the western Mediterranean (Theodor, 1964: 480) and Yugoslavia (Lupascu *et al.*, 1977: 192).

Phlebotomus* (*Larroussius*) *major syriacus Adler & Theodor

(Map 7)

Phlebotomus major Annandale [in part]; Adler & Theodor, 1929: 275 [♀ ♂]; Adler, 1946: 501; Cristescu & Dancescu, 1967: 320; Rioux & Golvan, 1969: 93; Rioux, Croset, Léger & Bailly-Choumara, 1974: 96.

Phlebotomus major var. *syriacus* Adler & Theodor, 1931: 467; Adler, 1946: 500 [♀]. Type(s), PALESTINE, SYRIA (depository unknown).

Phlebotomus (*Larroussius*) *major syriacus* Adler & Theodor; Theodor, 1958: 25 [♂]; Perfil'ev, 1968: 254; Houin, Abonnenc & Deniau, 1971: 644; Léger *et al.*, 1974: 20.

Phlebotomus (*Larroussius*) *major* Annandale [in part]; Biocca, Coluzzi & Constantini, 1977*a*: 160–162.

DISTRIBUTION. **Mediterranean, Caucasus, Crete, Crimea, Greece, Israel and Syria**: Theodor (1958: 25). **Greece**: Léger *et al.* (1979: 17). **Jordan**: Perfil'ev (1968: 255). **Turkey**: Houin *et al.* (1971: 644). **U.S.S.R.**: Izmail and Transcaucasia probably, Perfil'ev (1968: 255).

NOTE. In Greece, as in the Cévennes, Corsica and Serbia, *P. major* is abundant only above 300 m (Léger *et al.*, 1979: 20). It is evidently a good vector of VL (Molyneux, 1977: 48) and is a vector in the eastern Mediterranean area (Hoogstraal & Heyneman, 1969: 1185; Theodor, 1964: 480; Wilcocks & Manson-Bahr, 1972: 121). It is a main vector in Crete (Léger *et al.*, 1979: 20) and Greece (Adler, 1964: 80; Lupascu *et al.*, 1977: 192; Perfil'ev, 1968: 142), and may transmit VL in southern Italy and Sicily (Biocca *et al.*, 1977*a*: 165).

Phlebotomus* (*Larroussius*) *major wui Yang & Xiong

(Map 7, type area)

[*Phlebotomus major* Annandale; Ding & He, 1962: 388. Misidentification.]

Phlebotomus major wui Yang & Xiong, 1965: 412 [♀ ♂]. Syntypes ♀ ♂, CHINA: north and south Xinjiang (Institute of Parasitic Diseases, Chinese Academy of Medical Sciences, Shanghai).

Distribution. **China**: Artux, Dunhuang, Ha-mi, Kashi, Tacheng and Yning (Yang & Xiong, 1965); desert areas of Xinjiang and of Ejina County in Inner Mongolia (Wu *et al.*, 1979).

Note. This is probably *P. smirnovi* according to Professor Leng Y.-j. (1981, pers. comm.), and is a desert zoophilic form in south Xinjiang (Xiong *et al.*, 1970). The following are among features reported by Wu *et al.* (1979). In Xinjiang the form occurs from early May to late September, with population peaks in June and August; in the Karamay Desert it rests in gerbil burrows, and in the Tarim Basin attacks people near villages and is attracted to light. In Inner Mongolia the form occurs from early June to late August and has one peak in July.

Phlebotomus* (*Larroussius*) *mariae Rioux, Croset, Léger & Bailly-Choumara

(Map 7)

Phlebotomus (*Larroussius*) *mariae* Rioux, Croset, Léger & Bailly-Choumara, 1974: 92 [♂]. Syntypes 6 ♂, Morocco (EM, Montpellier).

Phlebotomus* (*Larroussius*) *mascittii Grassi

Phlebotomus mascittii Grassi, 1908: 681.
Phlebotomus (*Adlerius*) *mascittii* Grassi; Perfil'ev, 1968: 8, 16.

Phlebotomus* (*Larroussius*) *mascittii canaaniticus Adler & Theodor

(Map 8)

Phlebotus Adler & Theodor, 1931*b*: 468 [♀ ♂]. Syntypes 2 ♀, 4 ♂, Israel (BMNH).
Phlebotomus larroussei var. *canaaniticus* Adler & Theodor; Adler, Theodor & Witenberg, 1938: 501.
Phlebotomus (*Larroussius*) *mascittii canaaniticus* Adler & Theodor; Theodor, 1958: 31; Perfil'ev, 1968: 95.

Distribution. **General**: Perfil'ev (1968: 95, east of typical subspecies, in Israel, Jordan and Syria). **Israel**: Adler & Theodor (1931*b*: 471, Ben Shemen, Rosh Pinna, Tel Aviv); Adler & Witenberg (1938: 500, Jerusalem area).

Phlebotomus* (*Larroussius*) *mascittii mascittii Grassi

(Map 8)

Phlebotomus mascittii Grassi, 1908: 681 [♀ ♂]; Newstead, 1914: 182; Sinton, 1928: 310; Adler & Theodor, 1931*a*: 106; Hertig, 1950: 453 [discussion]; Raynal, 1954: 306; Guevara-Benîtez, Ubeda Ontiveros & Morillas Marquez, 1978: 832. Lectotype ♂, Italy (BMNH), designated by Hertig, 1950: 457 [examined].
Phlebotomus larroussei Langeron & Nitzulescu, 1931: 73; Raynal & Le Gac, 1932: 504; Adler, Theodor & Witenberg, 1938: 498; Hertig, 1950: 455 [probably *mascittii*]. Syntypes ♀, France (depository unknown). [Synonymized by Saccà, 1948*a*: 226; Raynal, 1954: 307.]
Phlebotomus vesuvianus Adler & Theodor, 1931: 108. Syntypes 13 ♀, Italy (BMNH). [Synonymized by Raynal, 1954: 307; Theodor, 1958: 29.]
Phlebotomus perniciosus var. *nitzulescui* Simić, 1932: 432. Syntypes 3 ♂, Yugoslavia (depository unknown). [Synonymized by Raynal, 1954: 307; Theodor, 1958: 29.]
Phlebotomus (*Phlebotomus*) *larroussei* Langeron & Nitzulescu; Parrot, 1941: 45.
Phlebotomus (*Adlerius*) *larroussei* Langeron & Nitzulescu; Theodor, 1948: 108.
Phlebotomus (*Adlerius*) *mascittii mascittii* Grassi; Saccà, 1949*b*: 552; Theodor, 1958: 29; Croset, 1969: 300; Houin, Abonnenc & Deniau, 1971: 642.
Phlebotomus (*Adlerius*) *mascittii* Grassi; Perfil'ev, 1968: 16 [discussion], 95; Rioux & Golvan, 1969: 27, 51, 73; Croset, 1969: 300; Houin, Abonnenc & Deniau, 1971: 642; Biocca, Coluzzi & Constantini, 1977*b*: 31.
Phlebotomus mascittii Grassi; Artemiev, 1980: 1181 [male fits *Larroussius*], 1185.

♀. Leg formula (after Raynal & Le Gac, 1932) 100, 135, 83; 135, 158, 89; 114, 187, 109 (0·86).

Distribution. **General**: Perfil'ev (1968: 95, western Europe as far east as Greece); Theodor (1958: 31, Corsica, Crete, Cyprus, France, Italy and Yugoslavia). **Europe**: Croset (1969: 305, map). **Crete**: Elounda, 35°16′N, 25°42′E (13.v.1979, *D. M. A.*, biting man indoors). **Cyprus**: Adler (1946: 503). **France**: Colas-Belcour & Rageau (1956, map); Croset (1969: 303, map); Houin *et al.* (1977: 113, map, 114); Rioux &

Golvan (1969: 75, 76, map, Calvados, Savignies etc.). **Italy**: Corradetti *et al.* (1956*a*: 6, map); Biocca *et al.* (1977*a*: 160, map; 1977*b*: 20, rare, 29, map); Maroli & Bettini (1977: 318); Puccini *et al.* (1977: 38, map). **Switzerland**: Gaschen (1956*a*: 225; 1956*b*: 228); Perfil'ev (1968: 16). **Turkey**: Houin *et al.* (1971: 642).

NOTE. *P. mascittii* is here placed provisionally in *Larroussius.*

Professor J. A. Rioux (1979, in *litt.*) told me the history of the Calvados (France) record, one of the most northerly for a sandfly, which was recounted to him by the late J. Colas Belcour. 'Dans sa proprietée de Normandie [at Condé-sur-Ife, 49°03′N, 0°07′W] séjournait à cette époque, Mme Colas Belcour. En plain jour, elle est attaquée par un Phlébotome. Elle a le réflexe de couvrir l'insecte avec un verre à boire et donc de le capturer vivant. Elle alerte immédiatement son mari qui travaillait à l'Institut Pasteur, dans de service de M. Roubaud. Colas Belcour récoupère le Phlébotome, l'identifie et le publie avec son épouse [Colas Belcour & Colas Belcour, 1929] comme *Phlebotomus perniciosus*'. Langeron & Nitzulescu (1932: 293) thought it was probably *P. larroussei* (= *mascittii*), and Colas Belcour & Tisseuil (1936: 121, footnote) and Raynal (1954: 309) agreed.

Savignies is 49°28′N, 01°58′E, and Rioux & Golvan (1969: 75) remarked that the species doubtless existed in Belgium, Germany and Luxembourg.

This species bites man but its ecology is little known (Croset, 1969: 309).

***Phlebotomus* (*Larroussius*) *orientalis* Parrot**

(Map 8)

Phlebotomus (*Phlebotomus*) *langeroni* var. *orientalis* Parrot, 1936: 30 [♀ ♂]; Kirk & Lewis, 1946*a*: 39; 1946*b*: 120; 1948: 326; 1955: 235. Syntypes 24 ♀, 32 ♂, ETHIOPIA (IP, Algiers).

[*Phlebotomus perniciosus* Newstead; Archibald & Mansour, 1937: 395; Sinton, 1937: 404; Kirk, 1939: 541. Misidentifications according to Kirk & Lewis, 1940: 627.]

[*Phlebotomus langeroni* Nitzulescu; Theodor, 1938: 165. Misidentification according to Kirk & Lewis, 1940: 627.]

Phlebotomus (*Phlebotomus*) *orientalis* Parrot; Parrot & Clastrier, 1946: 64; Kirk & Lewis, 1951: 432; 1952: 340; Heisch & Guggisberg, 1952: 427; Parrot, 1953: 113; Abonnenc, Dyemkouma & Hamon, 1964: 160; Abonnenc & Minter, 1965: 72; Hoogstraal & Heyneman, 1969: 1156; Abonnenc, 1972: 118.

Phlebotomus (*Larroussius*) *langeroni orientalis* Parrot; Theodor, 1958: 24; Qutubuddin, 1962: 597; Lewis & Hitchcock, 1968: 118; Perfil'ev, 1968: 92; Lewis, Minter & Ashford, 1974: 440.

Phlebotomus (*Phlebotomus*) *langeroni orientalis* Parrot; Quate, 1964: 238.

Phlebotomus orientalis Parrot; Davis, 1967: 52; Ashford, 1974: 610; Hoogstraal & Heyneman, 1969: 1156 [synonymy].

DISTRIBUTION. **Africa**: Abonnenc (1972: 259). **Ethiopia**: Ashford (1974: 608; 1977: 236, wide altitude range); Diredawa (1936, *C. A. V. B.*); Fuller *et al.* (1979: 419, map); Gemetchu & Fuller (1976: 82); Gemetchu *et al.* (1975: 45; 1977: 209). **Kenya**: Minter (1964: 207); Wajir (1943, *J. P. M.*). **Saudi Arabia**: Lewis & Büttiker, 1980: 263). **Southern Yemen**: 'Wadi Ayaraq' (1962, *S. A. S.*); Whittingham (1937, as *P. perniciosus*). **Sudan**: Hoogstraal & Heyneman (1969: 1155). **Yemen**: Büttiker & Lewis (1979: 370); Hoogstraal & Heyneman (1969: 1157); Lewis (1974*b*: 188).

NOTE. In the Sudan and Ethiopia this species occurs in *Acacia seyal-Balanites* forest which is associated with deeply cracking dark clay soils (Fuller *et al.*, 1979: 429). It was suspected of being the vector of VL in the Sudan by Kirk & Lewis (Adler, 1964: 78, 90) and shown to be so by the extensive work of Hoogstraal & Heyneman (1969: 1185, 1186, 1194) (Abonnenc, 1972: 34, 120; Wilcocks & Manson-Bahr, 1972: 122; Williams & Coelho, 1978: 17). It may transmit the disease in Ethiopia (Ashford *et al.*, 1973: 263; Fuller *et al.*, 1979: 429; Gemetchu *et al.*, 1977: 209; White, 1977: 163).

***Phlebotomus* (*Larroussius*) *pedifer* Lewis, Mutinga & Ashford**

(Map 8)

Phlebotomus (*Larroussius*) *pedifer* Lewis, Mutinga & Ashford, 1972: 12 [♀ ♂]; Mutinga, 1975: 347. Holotype ♂, KENYA (BMNH) [examined].

Phlebotomus pedifer Lewis, Mutinga & Ashford; Ashford, 1974: 610.

DISTRIBUTION. **Ethiopia**: Ashford (1974: 610, Boleta Forest, Ochollo); Lewis *et al.* (1972: 132, Shabe, 7°31′N, 36°30′E). **Kenya**: Lewis *et al.* (1972: 132, Mount Elgon area). **Sudan**: Lewis *et al.* (1972: 132, Gilo and Katire).

NOTE. *P. pedifer* bites man readily out of doors in the Mount Elgon area and transmits CL (Mutinga, 1975: 346) and is a vector of CL in Ethiopia (Ashford, 1977: 236; Bray, 1974: 92; Peters *et al.*, 1977: 502; White, 1977: 163).

Phlebotomus (*Larroussius*) *perfiliewi* Parrot

Phlebotomus perfiliewi Parrot, 1930: 383; Corradetti, Saccà & Neri, 1956*b*: 105; 1957: 226.
Phlebotomus (*Larroussius*) *perfiliewi* Parrot; Perfil'ev, 1968: 48 [larva], 50, 62, 75, 76, 83.

Phlebotomus (*Larroussius*) *perfiliewi galilaeus* Theodor

(Map 8)

Phlebotomus (*Larroussius*) *perfiliewi galilaeus* Theodor, 1958: 26 [♂; distinction from subsp. *transcaucasicus* uncertain]; Theodor & Mesghali, 1964: 292; Perfil'ev, 1968: 267. Syntypes ♂, CYPRUS, ISRAEL (BMNH).

DISTRIBUTION. **Cyprus and Israel**: Theodor (1958: 26). **Cyprus**: Liopetri, Panagera, 33°04′N, 35°20′E, Salamis, Sotira area (x.1971, *J. P. T. B.*). **Turkey**: Yasarol (1980).

Phlebotomus (*Larroussius*) *perfiliewi perfiliewi* Parrot

(Map 8)

Phlebotomus perfiliewi Parrot, 1930: 383 [♂]; Hertig, 1949*b*: 286; Saccá, 1950: 681 [early stages]; Corradetti, Saccà & Neri, 1956*b*: 105 [figures in pl. 2 transposed]; 1957: 226; Corradetti, Neri, Verolimi, Palmieri & Proietti, 1961: 102. Syntypes 4♂, U.S.S.R. (IP, Algiers?).
Phlebotomus macedonicus Adler & Theodor, 1931: 468 [♀ ♂]. Syntypes 4 ♀, 19 ♂, GREECE (BMNH). [Synonymized by Adler, 1946: 500.]
Phlebotomus perniciosus var.; Simić, 1932: 432. [Synonymized by Simić & Živković, 1956: 384.]
Phlebotomus sp. n.; Simić & Živković, 1947: 195. [Synonymized by Simić & Živković, 1956: 384.]
Phlebotomus (*Larroussius*) *perfiliewi perfiliewi* Parrot; Theodor, 1958: 25; Perfil'ev, 1968: 263.
Phlebotomus (*Larroussius*) *perfiliewi* Parrot; Perfil'ev, 1968: 263 etc.; Croset, 1969: 327; Biocca, Coluzzi & Constantini, 1977*a*: 160–162; 1977*b*: 30; Rioux, Croset, Léger & Rosin, 1977: 378; Croset, Rioux, Maistre & Bayar, 1978: 738.

DISTRIBUTION. **Balkans, Italy, Malta, north-west Africa and U.S.S.R. (Crimea)**: Dolmatova (1962: 459); Theodor (1958: 26). **Mediterranean area**: Croset (1969: 333, map); Dedet *et al.* (1977: 256); Rioux *et al.* (1977: 379, map). **Algeria**: Dedet (1979, map in *litt.*). **Greece**: Hadjinicolaou (1958: 968); Léger *et al.* (1979: 20); Macedonia (viii.1918, *J. W.*). **Italy**: Biocca *et al.* (1977*a*: 161, map; 1977*b*: 28, map); Hertig (1949*a*: 796, 797); Maroli & Bettini (1977: 318). **Morocco**: Rioux *et al.* (1977: 377). **Rumania**: Duport *et al.* (1971). **Sardinia**: Hertig (1949*a*: 798). **Tunisia**: Chadli, Dancescu *et al.* (1970: 361); Chadli, Romain *et al.* (1970: 358); Croset (1969: 331, map); Croset *et al.* (1978: 737, map); Dedet (1971: 157). **Turkey**: Yasarol (1980). **U.S.S.R.**: Parrot (1930: 383); Perfil'ev (1968: 266, Moldavia, north-east Caucasus). **Yugoslavia**: Simić & Živković (1956: 383–385, Kosovo i Metohija, Makedonija, Serbia, Sibenik, Split and Vojvodina).

NOTE. *P. perfiliewi* is a main vector of *Le. donovani* in Greece (Perfil'ev, 1968: 142), transmits VL in Serbia and possibly Greece, and canine leishmaniasis in Tunisia (Léger *et al.*, 1979: 20). It may have transmitted VL in Emilia-Romagna in 1971 under unusual weather conditions (Killick-Kendrick *et al.* (1977: 169, 173), and is probably a vector of VL in Rumania (Adler, 1964: 79). Its secondary role in canine kala-azar in Tunisia is discussed by Maroli & Bettini (1977: 320), and its relation to VL in Yugoslavia by them and Lupascu *et al.* (1977: 192).

This species transmits CL in Italy (Biocca *et al.*, 1977*b*: 20; Corradetti, 1977: 194; Rivosecchi *et al.*, 1977: 135), is a possible vector in Italy (Killick-Kendrick *et al.*, 1977: 169, 170, 173; Lupascu *et al.*, 1977: 192), and is the probable vector in the Abruzzi (Croset *et al.*, 1978: 739). It is strongly suspected of transmitting CL in part of Grosseto Province of Italy and of being the vector in the Abruzzi and Emilia-Romagna (Maroli & Bettini, 1977: 315, 320).

***Phlebotomus* (*Larroussius*) *perfiliewi transcaucasicus* Perfil'ev**

(Map 8)

Phlebotomus transcaucasicus Perfil'ev, 1937: 108 [♂]. Type(s), U.S.S.R.: Transcaucasia, Divichi (near Baku) and Nakhichevan (ZI, Leningrad?).

Phlebotomus (*Larroussius*) *perfiliewi transcaucasicus* Perfil'ev; Theodor, 1958: 26 [status undecided, possibly a synonym of *galilaeus*]; Theodor & Mesghali, 1964: 291; Perfil'ev, 1968: 267 [♀]; Ahmad, 1976: 43, 152, 156.

Distribution. **Iran**: Theodor & Mesghali (1964: 292, one at Kazvin). **Iraq**: Ahmad (1976: 99). **U.S.S.R.**: Perfil'ev (1968: 267) and Theodor & Mesghali (1964, Azerbaydzhan, Baku, Nakhichevan, north-east Caucasus and Transcaucasia); Dzhavadov *et al.* (1978: 143, Astanly, Dzhalilabad, Kanaga and Tazakent).

Note. This form appears to be a vector of *Le. donovani* in Azerbaydzhan (Perfil'ev, 1968: 142).

***Phlebotomus* (*Larroussius*) *perniciosus* Newstead**

(Map 9)

Phlebotomus nigerrimus Newstead, 1911*a*: 68 [♀]; Summers, 1913: 106; Perfil'ev, 1968: 9, 253. Syntypes 2 ♀, Malta. [Synonymized with *P. perniciosus* by Raynal, 1954: 301.]

Phlebotomus perniciosus Newstead, 1911*a*: 70 [♀ ♂]; Gaschen, 1945: 140 [♀ ♂]; 1956: 226; Hertig, 1950: 453; Saccà, 1950: 684 [early stages]; Raynal, 1954: 306; Corradetti, Saccà & Neri, 1956*b*: 105; 1957: 226; Abonnenc & Larivière, 1957: 401 [larva]; Guevara-Benîtez, Ubeda-Ontiveros & Morillas-Marquez, 1978: 821, 831. Syntypes ♀ ♂, Malta (depository unknown).

Phlebotomus legeri Mansion, 1913: 639; 1914: 588. Syntypes ♀ ♂, Corsica (L, Bastia?; Mansion, 1914: 590). [Synonymized by Larrousse, 1921: 40; Raynal, 1954: 301; Perfil'ev, 1968: 16; Theodor, 1958: 26.]

Phlebotomus perniciosus var. *nigerrimus* Newstead [?]; Newstead, 1914: 184; Perfil'ev, 1968: 9, 161, 253. [Synonymized by Larrousse, 1921: 40; Raynal, 1954: 301; Perfil'ev, 1968: 16.]

Phlebotomus lusitanicus França, 1918: 732. Type(s), Portugal (MB, Colares?; França, 1918: 731; 1922: 9, 18). [Synonymized by Larrousse, 1921: 37; Raynal, 1954: 301.]

Phlebotomus grassii Pierantoni, 1925: 5. Type(s), Italy: near Naples (MZ, Turin?; Pierantoni, 1925: 1, 8). [Synonymized by Adler & Theodor, 1931*a*: 106.]

Phlebotomus major Annandale var. *perniciosus* Newstead; Sinton, 1928: 303.

Phlebotomus (*Larroussius*) *perniciosus* Newstead; Theodor, 1948: 107; 1958: 26; Saccà, 1949*b*: 552; Nicoli, 1956: 112 [hairs]; Perfil'ev, 1968: 9; Rioux & Golvan, 1969: 25, 78; Croset, 1969: 397; Rioux, Croset, Léger & Bailly-Choumara, 1974: 96; Biocca, Coluzzi & Constantini, 1977*a*: 162; 1977*b*: 30; Croset, Rioux, Maistre & Bayar, 1978: 740.

Phlebotomus perniciosus legeri Mansion; Nicoli, 1955: 33; 1956: 110 [hairs].

♀. Leg formula, Spain, after Zariquiey, 1937: 411, 100, 110, 66; 101, 133, 77; 117, 177, 101 (0·78)(♀ & ♂ by Toumanoff & Chassignet, 1954: 680).

Distribution. **Western Europe and Africa**: Croset (1969: 407). **Algeria**: Dedet (1979, map *in litt.*); Dedet & Addadi (1977: 86); Dedet *et al.* (1977: 254, map). **France**: Colas-Belcour (1958: 826, map); Colas-Belcour & Rageau (1956, map); Croset (1969: 403, map); Houin *et al.* (1977: 113, map, 114); Rioux & Golvan (1969: 51, 83, map). **Italy**: Biocca *et al.* (1977*a*: 161, map; 1977*b*: 20, common and widespread, 28, map); Corradetti *et al.* (1956*a*: 6, map); Maroli & Bettini (1977: 318); Puccini *et al.* (1977: 38, map). **Jersey**: [?] Marett (1923*a*; 1923*b*, St. Helier which is 49°12′N). **Libya**: Ashford *et al.* (1977: 265). **Morocco**: Bailly-Choumara *et al.* (1971: 453). **Portugal**: Azavedo (1954: 247); França (1918: 731). **Sardinia**: Hertig (1949*a*: 798). **Spain**: 'Fulgencio' and 'Jalavara' (1931, through *J. A. S.*); Gil Collado (1977: 186); Najera (1937: 1488); Zariquiey (1944: 18). **Switzerland**: Gaschen (1956*b*: 228). **Tunisia**: Chadli, Dancescu *et al.* (1970: 363); Chadli, Romain *et al.* (1970: 358); Croset (1969: 405); Croset *et al.* (1978: 737, map); Dedet (1971: 157). **Turkey**: Yasarol (1980). **Yugoslavia**: Simić & Živković 1956: 383–385, north Dalmatia and Istra).

Note. '*P. nigerrimus*' was described from females, and Newstead (1911*a*) hoped that P. J. Marret would find males. Newstead (1914) examined some and considered them a dark variant of *perniciosus*, but a male labelled 'Malta. 1910. Capt. Marett. *Phlebotomus perniciosus* var. *nigerrimus*, Newst. Type ♂. Pres. R. Newstead B. M. 1947–141.' is *P. perfiliewi*. It seems likely that the original *nigerrimus* were *perniciosus*, but could be confused with dark forms of at least one other species.

The name *nigerrimus* has page preference over *perniciosus* but became a junior synonym of it following the action of Raynal, the first reviser (ICZN, 1964: Article 24 (a)).

In Jersey on 1 September 1923 Marett (1923*a*, *b*) was surprised to find a phlebotomine and wrote to the press as follows. 'Sir—I have the honour to request you to insert this letter in your paper. On the night of the 1st instant, I captured a Phlebotomus fly, and should be glad to know if any scientist may be breeding the fly in the Island. I have the honour to be, Sir, Your obedient servant, P. Jauvin Marett Lt. Col., M.O.H., States, Jersey. Royal Square 2/9/23.' The fly, a male, was identified by Newstead as *P. perniciosus*, but, in view of Hertig's (1953: 453) remarks on the aedeagus, it may conceivably have been *P. mascittii*. Dr W. J. Le Quesne (1970, 1971, *in litt.*) told me of the letter and informed me that Marett lived successively in two houses on the outskirts of St Helier. Le Quesne and other entomologists have sought this species without result. It may have been in Jersey since the island was attached to the mainland (Ragge, 1965: 256) and have disappeared with housing developments. It probably exists at the same latitude in France (Rioux & Golvan, 1969: 83).

P. perniciosus bites man indoors in Tunisia where its two annual peaks correspond with the transmission periods of VL (Croset *et al.*, 1978: 741, 743). It has been readily infected with the parasites of VL (Molyneux, 1977: 48) and is a vector in the western Mediterranean basin (Hoogstraal & Heyneman, 1969: 1185, 1186; Wilcocks & Manson-Bahr, 1972: 121), the main vector in north Africa (Dedet, 1976: 422; Perfil'ev, 1968: 142; Theodor, 1964: 480), and very probably the habitual vector in Tunisia (Croset *et al.*, 1978: 744). It transmits canine leishmaniasis near Tours in France (Houin *et al.*, 1977: 114), is probably the main vector of VL in Provence (Ranque *et al.*, 1977: 286, 292), has been proved to be the vector of VL in southern Italy (Biocca *et al.*, 1977*b*; Rivosecchi, 1977: 135), Sicily and Malta (Biocca *et al.*, 1977*a*: 165), and is probably the vector of VL in the Monte Argentario area of the Italian Province of Grosseto (Maroli & Bettini, 1977: 315, 320). Its relation to VL in general was discussed by Saf'yanova (1967: 36) and in Italy by Killick-Kendrick *et al.* (1977: 170, 173). It has been found to harbour a sandfly fever virus in Italy (Rivosecchi, 1977: 136).

Phlebotomus* (*Larroussius*) *smirnovi Perfil'ev

(Map 9)

Phlebotomus smirnovi Perfil'ev, 1941: 279 [♀ ♂]; Shakirzyanova, 1950: 26. Syntypes ♀, ♂, U.S.S.R. (ZI, Leningrad?).

Phlebotomus (*Larroussius*) *smirnovi* Perfil'ev; Theodor, 1958: 27; Perfil'ev, 1968: 277.

DISTRIBUTION. **U.S.S.R.**: Dergacheva *et al.* (1978, Kzyl-Orda area); Perfil'ev (1968: 95, 279, 281, Osh area in Kirgiziya).

NOTE. *P. smirnovi* probably transmits VL in the Kzyl-Orda region (Dergacheva *et al.*, 1978).

Phlebotomus* (*Larroussius*) *somaliensis Abonnenc, Adam & Bailly-Choumara

(Map 9)

Phlebotomus somaliensis Abonnenc, Adam & Bailly-Choumara, 1959: 588 [♀]; Abonnenc & Minter, 1965: 38; Abonnenc, 1972: 120. Holotype ♀, SOMALI REPUBLIC: cave at 'Shamah Aleh' near the Asseh Hills (IP, Algiers).

Phlebotomus* (*Larroussius*) *tobbi Adler & Theodor

(Map 9)

Phlebotomus perniciosus var. *tobbi* Adler & Theodor *in* Adler, Theodor & Lourie, 1930: 536 [♀ ♂]; Nitzulescu, 1931*b*: 267. Syntypes 27 ♀, 40 ♂, IRAN; ISRAEL (BMNH).

Phlebotomus tobbi Adler & Theodor; Parrot, 1934: 80.

Phlebotomus pirumovi Burakova & Mirzayan, 1934: 89 [short description in a footnote & reference to full description which was apparently not published]; Perfil'ev, 1968: 271, 273. Type(s), U.S.S.R. (ZI, Leningrad?). [Synonymized by Perfil'ev, 1941: 273, 281.]

Phlebotomus perniciosus Newstead [in part]; Adler & Theodor, 1957: 215 [proboscis].
Phlebotomus (*Larroussius*) *perniciosus tobbi* Adler & Theodor; Theodor, 1958: 27; Rioux & Golvan, 1969: 81, 82; Ahmad, 1976: 43, 144; Guevara-Benîtez, Ubeda-Ontiveros & Morillas-Marquez, 1978: 832.
Phlebotomus (*Larroussius*) *tobbi* Adler & Theodor; Perfil'ev, 1968: 271; Croset, 1969: 341; Houin *et al.*, 1971: 635.

DISTRIBUTION. **Eastern Mediterranean area**: Perfil'ev (1968: 273, Cyprus, Greece, Israel, Jordan and Syria); Theodor & Mesghali (1964: 292, widely distributed from Yugoslavia to north-west Iran). **Europe and North Africa**: Croset (1969: 342, probably not in western Europe; 1967: 177, Tunisian records probably refer to *P. longicuspis* or *P. perfiliewi*); Dolmatova (1962: 460, map, evidently including *P. perniciosus*); Houin (1977: 167, not west of Yugoslavia; old records from France and Spain must refer to *P. perniciosus*). **Albania**: Perfil'ev (1968: 8, possibly *P. perniciosus*). **Greece**: Hadjinicolaou (1958: 968, 972); Hertig (1949*a*: 779, 781–783); 'Kerken', Struma Valley (26.vi.1935, *P. A. B.*); Léger *et al.* (1979: 17). **Iran**: Adler *et al.* (1930: 537, Resht); Lewis *et al.* (1961: 206); Nadim & Rashti (1978: 27, areas indicated); Nadim *et al.* (1977: 215); Theodor & Mesghali (1964: 291, 292, in north-west; probably some early records refer to *P. major*). **Iraq**: Ahmad (1976: 99). **Israel**: Adler *et al.* (1930: 537, Ajaleth, Rosh Pinna); Pazael (7.v.1979, *Y. S.*). **Lebanon**: Mechref (1964, *L. E. S.*). **Sicily**: Catania (♂ presented to BMNH in 1931 by *S. A.* as *P. perniciosus*; 'var. *tobbi*' added in Theodor's writing). **Turkey**: Houin *et al.* (1971: 635). **U.S.S.R.**: Dzhavadov *et al.* (1978: 143, Astanty, Dzhalilabad and Tazakent); Perfil'ev (1968: 273, Armenia, Azerbaydzhan and Gruziya; absent from Turkestan); Theodor & Mesghali (1964: 292). **Yugoslavia**: Nitzulescu (1931*b*: 267, Skoplje); Simić & Živković (1956: 383–385, north and south Dalmatia, Hercegovinia, Istra, Kosovo i Metohija, Makedonija, Montenegro and Serbia).

NOTE. *P. tobbi* is a vector of VL in the eastern Mediterranean area and probably in Transcaucasia (Theodor, 1964: 480, 485) and is probably a vector in Azerbaydzhan (Perfil'ev, 1968: 142) and Cyprus (Adler, 1946: 510). It is too rare to be significant in Greece(Léger *et al.*, 1979: 23).

Phlebotomus* (*Larroussius*) *wenyoni Adler & Theodor

(Map 9)

Phlebotomus wenyoni Adler & Theodor *in* Adler, Theodor & Lourie, 1930: 353 [♀ ♂]. Syntypes 25 ♀, 53 ♂, IRAN (BMNH).
Phlebotomus (*Larroussius*) *wenyoni* Adler & Theodor; Theodor, 1958: 27; Theodor & Mesghali, 1964: 291; Ahmad, 1976: 49, 162.

DISTRIBUTION. **General**: Theodor & Mesghali (1964: 292, apparently very restricted). **Iran**: Nadim *et al.* (1978: 27, Chahar Mahal and other areas); Theodor & Mesghali (1964: 292, Hamadan, Kermanshah, Malayer and Tehran; seemed restricted to north-west). **Iraq**: Ahmad (1976: 99); Theodor & Mesghali (1964: 292, Salahuddin). **Turkey**: Yasarol (1980). **U.S.S.R.**: Perfil'ev (1968: 270, Ashkabad and Karakala areas in Turkmeniya); Petrishcheva (1935: 20).

According to Theodor & Mesghali (1964) some old records may refer to *P. keshishiani* or *P. major*.

Subgenus *ADLERIUS* Nitzulescu

Phlebotomus subgenus *Adlerius* Nitzulescu, 1931: 271; Theodor, 1948: 98; 1958: 27; Theodor & Mesghali, 1964: 292; Perfil'ev, 1968: 73, 81, 280 [also vii, 8, 48 (larva), 51, 60 (egg), 75, 77, 280 on *P. chinensis* s. l.]; Lewis, 1978*b*: 239; Artemiev, 1978: 19, 20, 75; 1980: 1171, 1180. Type-species: *Phlebotomus chinensis* Newstead, 1926, by original designation.

Professor Leng Yan-jia informed me in 1980 that several taxa in China await study, therefore most '*P. chinensis*' in Map 10 are marked with a query.

Key to the species of subgenus *Adlerius* (after Artemiev, 1980).

Females

Artemiev recommends that males should be identified first, and accompanying females compared with data in his table. Some characters are indefinite, and descriptions should be consulted.

Males

1 Two ascoids on antennal segments 3–15 . . . 2
– One ascoid on antennal segments 9–15 . . . 3
2 Subterminal tubercle of aedeagus far (30–35 μm) from tip . . . ***chinensis*** (p. 165)
– Subterminal tubercle of aedeagus near (6–8 μm) tip . . . ***simici*** (p. 168)
3 Antenna 8 with two ascoids . . . 4
– Antenna 8 with one ascoid . . . 11
4 Coxite with 14–27 hairs in group, rarely 29 . . . 5
– Coxite with 29–115 hairs in group, rarely 27 . . . 6
5 Whole hair-group on basal half of coxite. Tubercle of aedeagus 6–16 μm from tip ***turanicus*** (p. 168)
– Part of hair-group on distal half of coxite. Tubercle of aedeagus 19–28 μm from tip . ***brevis*** (p. 165)
6 All 69–114 hairs of group on basal half of coxite; coxite wide . . . ***rupester*** (p. 167)
– Some of 27–85 hairs of group on distal half of coxite . . . 7
7 Aedeagus with rectangular subterminal notch . . . ***halepensis*** (p. 166)
– Aedeagus with normal obtuse-angled subterminal notch . . . 8
8 Coxite with 27–50 group-hairs. Sandfly dark . . . ***kabulensis*** (p. 167)
– Coxite with 50–85 group-hairs. Sandfly of normal colour or pale . . . 9
9 Sperm tubes long (1200–1700 μm) . . . ***longiductus*** (p. 167)
– Sperm tubes of average length (900–1100 μm) . . . 10
10 Coxite with 50–60 group-hairs. Sandfly large (antenna 3 = 400–430 μm) . . . ***arabicus*** (p. 164)
– Coxite with 65–75 group-hairs. Sandfly of normal size (antenna 3 = 340–375 μm). Iran 'Sp. 1' of doubtful status (related to *arabicus*)
11 Antenna 6 and 7 with two ascoids of same length . . . 12
– Antenna 6 and 7 with one ascoid or with one long and one short . . . 14
12 Coxite with 35–60 group-hairs. Sperm tubes 740–1000 μm long. Sandfly small . . . ***davidi*** (p. 166)
– Coxite with 69–110 group-hairs . . . 13
13 Coxite with 69–94 group-hairs . . . ***hindustanicus*** (p. 166)
– Coxite with 99–111 group-hairs. Afghanistan . . . Sp. 2 (possibly a subsp. of *hindustanicus*)
14 Coxite with 90–220 group-hairs. Ventral process of style long (about 20 μm) . . . 15
– Coxite with 30–85 group-hairs. Ventral process of style long or short . . . 16
15 Coxite very wide, whole group of 125–200 hairs on its basal half . . . ***comatus*** (p. 166)
– Coxite narrow, part of hair-group on its distal half . . . ***balcanicus*** (p. 165)
16 Ventral process of style long . . . ***zulfagarensis*** (p. 168)
– Ventral process of style short . . . 17
17 Whole hair-group (40–85) of coxite on its basal half . . . ***salangensis*** (p. 168)
– Part of hair-group on distal half of coxite . . . 18
18 Antenna 3 = 1·20–1·55 times length of labrum. Coxite with 35–70 group-hairs . . . ***angustus*** (p. 164)
– Antenna 3 = 1·05–1·20 times length of labrum. Coxite with 30–50 group-hairs . . . ***kyreniae*** (p. 167)

Phlebotomus* (*Adlerius*) *angustus Artemiev

(Map 10)

[*Phlebotomus* (*Adlerius*) *chinensis longiductus* Parrot; Lewis, 1967: 21 [in part]. Misidentification.]

[*Phlebotomus* (*Adlerius*) *longiductus* Parrot; Artemiev, 1974: 163 [in part]; Lewis, 1978*b*: 240 [in part]. Misidentifications.]

Phlebotomus (*Adlerius*) *angustus* Artemiev, 1978: 22 [♀ ♂]; 1980: 1189. Holotype ♂, AFGHANISTAN (MI, Moscow).

DISTRIBUTION. **Afghanistan**: Artemiev (1978: 22, in north and centre in high rocky mountains). **Pakistan**: Lewis (1967: 23, Gilgit area, i.e. Gilgit, Gol, Gwari, Keris and Parkuta; 84 ♂ of *Adlerius* from this area examined in 1979 found to be a mixture of *P. angustus* and *salangensis*). **U.S.S.R.**: Artemiev (1978: 22, Tadjikistan and Uzbekistan).

In Afghanistan *P. angustus* occurs in high rocky mountains (Artemiev, 1978: 22).

Phlebotomus* (*Adlerius*) *arabicus Theodor

(Map 10)

Phlebotomus (*Adlerius*) *chinensis arabicus* Theodor, 1953: 120 [♀ ♂]; Artemiev, 1974: 163. Syntypes 2 ♀, 1 ♂, YEMEN (BMNH).

Phlebotomus chinensis arabicus Theodor; Abonnenc & Minter, 1965: 32; Abonnenc, 1972: 111.
Phlebotomus (*Adlerius*) *arabicus* Theodor; Artemiev, 1980: 1190.

DISTRIBUTION. **Ethiopia (?)**: Ashford (1974: 610). **Saudi Arabia**: Büttiker & Lewis (1980). **Yemen**: Büttiker & Lewis (1978: 371); Theodor (1953: 120).

Phlebotomus* (*Adlerius*) *balcanicus Theodor

(Map 10)

[*Phlebotomus chinensis* Newstead; Nitzulescu, 1930*a*: 367 [♀ ♂]. Misidentification.]
Phlebotomus (*Adlerius*) *chinensis balcanicus* Theodor, 1958: 28 [differs in some respects from Nitzulescu's form but has similar hair-group on coxite]; Theodor & Mesghali, 1964: 292; Dancescu, 1967: 426; 1968: 189; Perfil'ev, 1968: 290; Léger, Saratsiotis, Pesson & Léger, 1979: 23, 24 [found variants which cast doubt on status of taxon]. Holotype ♂, GREECE (BMNH).
Phlebotomus (*Adlerius*) *balcanicus* Theodor; Artemiev, 1980: 1188 [raised to species].

DISTRIBUTION. **South-east Europe**: Theodor (1958: 29). **Crete**: (as *P. chinensis*) Hadjinicolaou (1958: 974); Hertig (1949*a*: 788, 789). **Greece**: (as *P. chinensis*) Hadjinicolaou (1958: 968, 970, 972); Hertig (1949*a*: 781–786); Léger *et al.* (1979: 17); Theodor (1958: 28, Yannitsa). **Iran**: Theodor & Mesghali (1964: 293). **Rumania**: Duport *et al.* (1971: 388, 389). **Turkey**: Yasarol (1980). **U.S.S.R.**: Dergacheva (1977: 1572, Azerbaydzhan). **Yugoslavia**: Zivković (1974: 4, map).

NOTE. This species may transmit VL in Greece (Léger *et al.*, 1979: 23).

Phlebotomus* (*Adlerius*) *brevis Theodor & Mesghali

(Map 10)

Phlebotomus (*Adlerius*) *chinensis brevis* Theodor & Mesghali, 1964: 293 [♀ ♂]. Holotype ♂, IRAN (IPH, Tehran).
Phlebotomus (*Adlerius*) *chinensis ismailicus* Perfil'ev, 1966: 314 [♂]; 1968: 288 [♀]. Type(s), U.S.S.R.: Ismail (ZI, Leningrad?). [Synonymized by Artemiev, 1980: 1183.]
Phlebotomus (*Adlerius*) *brevis ismailicus* Perfil'ev; Artemiev & Dergacheva, 1977: 1574.
Phlebotomus (*Adlerius*) *brevis* Theodor & Mesghali; Artemiev & Dergacheva, 1977: 1572 ['*chinensis*' from Agdam area of Azerbaydzhan sympatric with *balcanicus* and *halepensis* and distinct from Chinese form]; Artemiev, 1980: 1183.

DISTRIBUTION. **Iran**: Nadim *et al.* (1978: 27, 28); Theodor & Mesghali (1964: 293). **Turkey**: Yasarol (1980). **U.S.S.R.**: Artemiev & Dergacheva (1977: 1574); Dzhavadov *et al.* (1978: 143, Astanty, Dzhalilabad, Khanaga and Tazakent).

Phlebotomus* (*Adlerius*) *chinensis Newstead

(Map 10)

Phlebotomus major var. *chinensis* Newstead, 1916: 191 [♀ ♂]; Foo-Hai, 1934: 498. Lectotype ♂, CHINA (BMNH), designated by Lewis, 1978*b*: 239 [examined].
Phlebotomus chinensis Newstead; Sinton, 1928: 306 [in part, synonymy]; 1932: 59; 1933: 418; Patton & Evans, 1929: 29, 83, 137, 151, 162, 166, 215, 219, 223, 227; Yao & Wu, 1941: 78; Guan *et al.*, 1980: 25 [variation].
Phlebotomus (*Adlerius*) *chinensis chinensis* Newstead; Theodor, 1958; Theodor & Mesghali, 1964: 292; Perfil'ev, 1968: 281; Lewis, 1978*b*: 239.
Phlebotomus (*Adlerius*) *chinensis* Newstead; Artemiev, 1980: 1183.

♂ (*extra fact*, China, Wo Fu Su Temple, 1–6.vii.1914, *R. A. B.*). Leg formula 100, 131, 83; 98, 160, 95; 111, 188, 108 (0·81). Legs also examined by Nitzulescu (1930*a*: 365, 369) and Patton & Hindle (1926: 406).

RECORDED DISTRIBUTION. See note under subgenus. **China**: Guan *et al.* (1980, Gansu, Shanxi and Sichuan Provinces); He K'ai-zeng *et al.* (1959); Leng (1978: 7, no. 5 on map); Leng (1980, pers. comm., Qianshan); Leng & Chang (1964: 208); Lewis (1978*b*: 239, 325); Patton & Hindle (1928: 546, Chi-nan, Tsinan).

NOTE. *P. chinensis* is the vector of VL in China (Dedet, 1976: 421; Hoogstraal & Heyneman, 1969: 1185; Perfil'ev, 1968: 140; Theodor, 1964: 484; Wilcocks & Manson-Bahr, 1972: 121).

Phlebotomus* (*Adlerius*) *comatus Artemiev

(Map 10)

Phlebotomus (*Adlerius*) *comatus* Artemiev, 1978: 21 [♂]; 1980: 1188 [♀]. Holotype ♂, AFGHANISTAN (MI, Moscow).

The female is known but not described (Artemiev, 1979, *in litt.*).

DISTRIBUTION. **Afghanistan**: Artemiev (1978: 21). **Nepal** (?): Chobhar (1976, *J. W. N.*, ♀ only examined).

NOTE. In Afghanistan *P. comatus* is a rare species of rocky mountains between 1000 and 2600 m (Artemiev, 1978: 21).

Phlebotomus* (*Adlerius*) *davidi Artemiev

(Map 10)

[*Phlebotomus* (*Adlerius*) *chinensis arabicus* Theodor; Lewis, 1974: 189; Lewis & Büttiker, 1980: 263. Misidentifications.]
[?*Phlebotomus chinensis* Newstead; Ashford, 1974: 610 [very like *arabicus*]. Misidentification.]
Phlebotomus (*Adlerius*) *davidi* Artemiev, 1980: 1191 [♀ ♂]. Holotype ♂, YEMEN: Ta'izz (MI, Moscow).

DISTRIBUTION. **Ethiopia**: Artemiev (1980, probably this species). **Yemen**: Ta'izz.

Phlebotomus* (*Adlerius*) *halepensis Theodor

(Map 10)

Phlebotomus (*Adlerius*) *chinensis halepensis* Theodor, 1958: 29 [♀ ♂]; Mesghali, 1963: 1075; Theodor & Mesghali, 1964: 293; Perfil'ev, 1968: 291. Syntypes, IRAN, SYRIA (BMNH).
?*Phlebotomus chinensis monticola* Tarvit-Gontar, 1956: 158; Perfil'ev, 1968: 295 [position doubtful]. Type(s), U.S.S.R. (depository unknown). [Junior primary homonym of *Phlebotomus monticolus* Lima, 1932.]
Phlebotomus (*Adlerius*) *halepensis* Theodor; Artemiev, 1980: 1190.

DISTRIBUTION. **Iran, north Syria and U.S.S.R.**: Theodor (1958: 29). **Iran**: Nadim *et al.* (1977: 215; 1978: 27, 28); Theodor & Mesghali (1964: 293, Tehran etc.). **Israel**: Dishon (= Deishum, 28.vii.1942, det. *O. T.*). **Syria**: Theodor & Mesghali (1964: 293, Aleppo). **Turkey**: Yasarol (1980). **U.S.S.R.**: Artemiev & Dergacheva (1977: 1572); Theodor & Mesghali (1964: 293, Tbilisi).

NOTE. *P. monticola* might be a synonym of *P. halepensis* but the name must be permanently rejected as a junior primary homonym of *P. monticolus* Lima, 1932: 50 (ICZN, 1964: Articles 53, 57 and 57(b)).

In the U.S.S.R. (Perfil'ev, 1935: 96, map; 1968: 89) '*P. chinensis*' occurs as far north as 47° in the southern Ukraine, in a part of East Kazakhstan with a mean winter temperature of −16°C, and up to 2800 m.

'*P. chinensis*' appears to be a vector of *Le. donovani* in Gruziya (Perfil'ev, 1968: 142) and possibly in Turkestan (Theodor, 1964: 485) and was considered to be a main vector in Transcaucasia, Central Asia and Kazakhstan (Sergiev, 1979: 208).

Phlebotomus* (*Adlerius*) *hindustanicus Theodor

(Map 10)

[*Phlebotomus chinensis* Newstead; Sinton, 1928: 306 [in part]. Misidentification.]
Phlebotomus (*Adlerius*) *chinensis hindustanicus* Theodor, 1958: 29, 30 [♀ ♂]. Syntypes ♂, NORTH-WEST OF INDIAN SUBCONTINENT (BMNH).
[*Phlebotomus* (*Adlerius*) *chinensis longiductus* Parrot; Lewis, 1967: 21 [in part]. Misidentification.]
Phlebotomus (*Adlerius*) *hindustanicus* Theodor; Artemiev, 1978: 23 [and a possible variant classed as Species 1]; 1980: 1191.

Distribution. **Afghanistan**: Artemiev (1978: 23, Gorband valley, Mahi-Par, 34°39′N, 69°42′E and Sarobi; in low rocky mountains). **India**: Bin Sar in Uttar Pradesh (BMNH); Kasauli (*J. A. S.*); Tapoban village in Chamoli district (13.vi.1969, *V. D.*). **Pakistan**: Rawalpindi (1959, *H. C. B.*; all 11 ♂ *Adlerius* examined in 1979 were this species). **Nepal:** Chobhar (1976, *J. Wn.*).

Note. In Afghanistan *P. hindustanicus* occurs in low rocky mountains (Artemiev, 1978: 23).

Phlebotomus (*Adlerius*) *kabulensis* Artemiev

(Map 10)

Phlebotomus (*Adlerius*) *kabulensis* Artemiev, 1978: 21 [♀ ♂]; 1980: 1188. Holotype ♂, Afghanistan (MI, Moscow).

Distribution. **Afghanistan**: 'Gorband', Kabul, Kandahar and Pangshir (Artemiev, 1978).

Note. This species is found in dwellings and is rather thermophilic and hydrophilic.

Phlebotomus (*Adlerius*) *kyreniae* Theodor

(Map 11)

[*Phlebotomus chinensis* Newstead; Adler, 1946: 498 [♀ ♂]; Theodor, 1953: 120. Misidentifications.]
Phlebotomus (*Adlerius*) *chinensis kyreniae* Theodor, 1958: 29 [♀ ♂]. Syntypes ♀ ♂, Cyprus (BMNH).
Phlebotomus (*Adlerius*) *kyreniae* Theodor; Artemiev, 1980: 1185.

Distribution. **Cyprus**: Theodor (1978). **Turkey**: Yasarol (1980).

Note. This form probably transmits canine kala-azar in Cyprus (Adler, 1946: 510; Lupascu *et al.*, 1977: 192).

Phlebotomus (*Adlerius*) *longiductus* Parrot

(Map 11)

Phlebotomus major var. *longiductus* Parrot, 1928: 29 [♂]; 1940: 310 [in part; ascoid formula of '*longiductus*' variable]; 1946: 68; Nitzulescu, 1929: 430. Syntypes 2 ♂, U.S.S.R.: Shakrisyabz near Samarkand (depository unknown).
[*Phlebotomus chinensis* Newstead [in part]; Nitzulescu, 1930*a*: 373 [?]. Misidentification.]
Phlebotomus chinensis var. *longiductus* Parrot; Nitzulescu, 1931*a*: 264 [♀].
Phlebotomus (*Adlerius*) *chinensis* var. *longiductus* Parrot; Theodor, 1948: 107.
Phlebotomus (*Adlerius*) *chinensis longiductus* Parrot; Theodor, 1958: 29 [in part]; Perfil'ev, 1968: 285; Dancescu, Cristescu, Costin *et al.*, 1970: 57.
Phlebotomus (*Adlerius*) *chinensis tauriae* Perfil'ev, 1966: 286; 1968: 62, 286. Type(s), U.S.S.R.: Crimea (MI, Moscow?) [Synonymized by Artemiev, 1978: 20.]
Phlebotomus chinensis tanriae Perfil'ev; Saladze, 1972: 617. [Mis-spelling.]
Phlebotomus (*Adlerius*) *longiductus* Parrot; Artemiev, 1974: 163 [in part]; 1978: 20; 1980: 1190.

Distribution. **Afghanistan**: Artemiev (1978: 20, north and centre). **Rumania**: Artemiev (1978: 20); Dancesco *et al.* (1970: 60, map); Duport *et al.* (1971). **U.S.S.R.**: Artemiev (1978: 20, Central Asia, Crimea, Kazakhstan, northern Caucasus and southern Ukraine); Gaibov (1975*b*, rare in Fergana area); Saladze (1972: 617, Mtshketa district).

Note. In Afghanistan *P. longiductus* occurs in houses in plains between 1000 and 2000 m and is very anthropophilic; in the mountains of Kazakhstan it is the main vector of VL (Artemiev, 1978: 20).

Phlebotomus (*Adlerius*) *rupester* Artemiev

(Map 11)

Phlebotomus (*Adlerius*) *rupester* Artemiev, 1978: 21 [♀ ♂]; 1980: 1188. Holotype ♂, Afghanistan (MI, Moscow).

Note. In Afghanistan *P. rupester* occurs in very high rocky mountains up to 3300 m (Artemiev, 1978: 21)

Phlebotomus* (*Adlerius*) *salangensis Artemiev

(Map 11)

Phlebotomus (*Adlerius*) *salangensis* Artemiev, 1978: 22 [♀ ♂]; 1980: 1189. Holotype ♂, AFGHANISTAN (MI, Moscow).

Phlebotomus* (*Adlerius*) *simici Nitzulescu

(Map 11)

Phlebotomus chinensis var. *simici* Nitzulescu, 1931*a*: 264 [♀ ♂]. Syntypes ♀ ♂, YUGOSLAVIA (IH, Skoplje?).
Phlebotomus (*Phlebotomus*) *chinensis* var. *simici* Nitzulescu; Parrot, 1941*a*: 45.
Phlebotomus (*Adlerius*) *simici* Nitzulescu; Theodor, 1958: 31; Perfil'ev, 1968: 282, 293; Artemiev, 1974: 164; 1980: 1185; Léger, Saratsiotis, Pesson & Léger, 1979: 24.
Phlebotomus (*Adlerius*) *chinensis simici* Nitzulescu; Houin, Abonnenc & Deniau, 1971: 642.

DISTRIBUTION. **Balkans, Iran, Syria and Turkey**: Theodor (1958: 32). **Crete**: Hertig (1949*a*: 787). **Greece**: Léger *et al.* (1979: 17). **Turkey**: Houin *et al.* (1971: 642); Yasarol (1980). **U.S.S.R.**: Gaibov (1975*b*, Fergana area); Perfil'ev (1968: 285, central Asia and Transcaucasia). **Yugoslavia**: Nitzulescu (1931*a*: 265, Skoplje); Simić & Živković (1956: 383–385, Hercegovina, Kosovo i Metohija, Makedonija and Serbia).

NOTE. *P. simici* is a vector of VL in the eastern Mediterranean area (Theodor, 1964: 480) and is considered to be one in Yugoslavia (Lupascu *et al.* 1977: 192).

Phlebotomus* (*Adlerius*) *turanicus Artemiev

(Map 11)

Phlebotomus (*Adlerius*) *simici turanicus* Artemiev, 1974: 163 [♀ ♂]. Types 6 ♀, 4 ♂, AFGHANISTAN (MI, Moscow).
Phlebotomus (*Adlerius*) *turanicus* Artemiev, 1978: 20; 1980: 1185.

DISTRIBUTION. **Afghanistan**: Artemiev (1978: 20, Aliabad etc. in north, probably also in Iran). **U.S.S.R.**: Artemiev (1978: 20, southern Tadzhikistan, southern Turkmeniya and southern Uzbekistan).

NOTE. In Afghanistan *P. turanicus* seems to be thermophilic and xerophilic and can stand a cold winter, is found mainly in rodent and bird burrows and sometimes in houses, and will attack man (Artemiev, 1978: 20).

Phlebotomus* (*Adlerius*) *zulfagarensis Artemiev

(Map 11)

Phlebotomus (*Adlerius*) *zulfagarensis* Artemiev, 1978: 22 [♀ ♂]; 1980: 1189. Holotype ♂, U.S.S.R. (MI, Moscow).

DISTRIBUTION. **Iran**: Artemiev (1978: 22). **U.S.S.R.**: Artemiev (1978: 22, Turkmeniya).

Subgenus ***EUPHLEBOTOMUS*** Theodor

Phlebotomus subgenus *Euphlebotomus* Theodor, 1948: 98; 1958: 32; Perfil'ev, 1968: 33 [parameres], 34, 78, 83; Hennig, 1972: 53; Lewis, 1978*b*: 240; Artemiev, 1979: 19 [key to ♂ including one species not described]. Type-species: *Phlebotomus argentipes* Annandale & Brunetti, 1908, by original designation.

Key to the species and subspecies of subgenus *Euphlebotomus*

Females

1 Spermatheca bulbous with faint striations near duct, with head on a distinct narrow neck. Pharyngeal armature comprising five or six anterior rows of grouped spicules and many minutely spiculate transverse ridges . . . . ***tumenensis*** (p. 170)
– Spermatheca not bulbous, without narrow neck. Pharyngeal armature comprising distinct teeth or ridges 2
2 Spermatheca with faint transverse striations or indistinct segments 3
– Spermatheca distinctly segmented 4

3 Spermatheca with large apical segment and about 15 indistinct segments. Pharynx with many uniform teeth . . . **mesghalii** (p. 170)
– Spermatheca with small apical segment and about 30 transverse striations. Pharynx with a median group of small teeth and, behind them, some close-set concentric lines **kiangsuensis** (p. 170)
4 Spermathecal common duct with rather thin walls. Antenna 5 without papilla . **argentipes** (p. 169)
– Spermathecal common duct with thick walls. Antenna 5 with papilla . . . 5
5 Antenna 3/labrum 1·0 . . . ***philippinensis philippinensis*** (p. 170)
– Antenna 3/labrum 1·4 . . . ***philippinensis gouldi*** (p. 170)

Males

1 Paramere with two lobes . . . ***mesghalii*** (p. 170)
– Paramere with three lobes . . . 2
2 Middle lobe of paramere nearly rectangular . . . ***caudatus*** (p. 169)
– Middle lobe of paramere with rounded end . . . 3
3 Middle lobe of paramere thicker than main (upper) lobe . . . ***kiangsuensis*** (p. 170)
– Middle lobe of paramere thinner than main lobe . . . 4
4 Main lobe of paramere much more than twice length of middle lobe, lower lobe narrow, depth of paramere about 0·29 of its length (measured to junction with coxite) . . ***argentipes*** (p. 169)
– Main lobe of paramere about twice length of middle lobe . . . 5
5 Aedeagus without accessory spines . . . ***tumenensis*** (p. 170)
– Aedeagus with accessory spines.
Lower lobe of paramere appearing narrow but extending mesally, depth of paramere about 0·35 of its length . . . 6
6 Antenna 3/labrum 1·7. Style 0·54 length of coxite, and more than four times as long as thick ***philippinensis philippinensis*** (p. 170)
– Antenna 3/labrum 2·0. Style 0·61 length of coxite, and about three times as long as thick ***philippinensis gouldi*** (p. 170)

Phlebotomus* (*Euphlebotomus*) *argentipes Annandale & Brunetti

(Map 12)

Phlebotomus argentipes Annandale & Brunetti *in* Annandale, 1908: 101 [♀ ♂]; Summers, 1911: 108; Patton & Evans, 1929: 228. Lectotype ♂, INDIA (ZSI, Calcutta), designated by Quate, 1962*a*: 157.

Phlebotomus (*Euphlebotomus*) *argentipes* Annandale & Brunetti; Perfil'ev, 1968: 61 [egg]; Lewis, 1978*b*: 240 [synonymy including *annandalei*, *marginatus* (apparently lost, according to Quate, 1962*a*: 157) and *zeylanicus* ♂ as synonyms]; Artemiev, 1978: 24; Killick-Kendrick, 1978: 309 [variation].

♀ (*extra facts*). Leg formula (two from West Malaysia, Lamir) 100, 126, 79; 97, 154, 95; 107, 182, 135 (2·23, 0·85); 100, 129, 76; 98, 148, 94; 107, 165, 104; (India, Ranighat) 100, 125, 75; 95, 151, 93; 106, 180, 108.
♂. Shaft of haltere 0·15 length of wing.

DISTRIBUTION. **The Orient**: Lewis (1978*b*: 325, map). **India**: Modi *et al.* (1978: 748, Maharashtra, map). Pandya *et al.* (1977: 133). The record from Iran by Javadian (1975: 207) was omitted by Artemiev (1978) and appears to be incorrect.

NOTE. Lewis (1978*b*: 323, 330, 331) summarized aspects of this species and reported geographical variation which was partly associated with differences in feeding habits. Spiculate ascoids were noted in India by S. Das (1973, *in litt.*). *S. argentipes* is an important vector of VL in India (Adler, 1964: 69; Bray, 1974: 93; Hoogstraal & Heyneman, 1969: 1186; Perfil'ev, 1968: 141; Shanmugham *et al.*, 1977: 796; Theodor, 1964: 482; Wilcocks & Manson-Bahr, 1972: 122). Houses were sprayed against malaria vectors in the early 1950s but *P. argentipes* seemed likely to flourish in neighbouring vegetation (Anonymous, 1955). Kala-azar, greatly reduced during the anti-malarial campaign, broke out on a large scale in 1977 (Killick-Kendrick, 1978: 306) when both spraying and treatment seemed necessary to cope with it. By 1978 control was not complete (Anonymous, 1978).

Phlebotomus* (*Euphlebotomus*) *caudatus Artemiev

(Map 12)

Phlebotomus (*Euphlebotomus*) *caudatus* Artemiev, 1978: 25; 1979: 17 [♂]. Holotype ♂, AFGHANISTAN: Farah-Rud area (BMNH) [examined].

NOTE. In Afghanistan *P. caudatus* occurs in low desert mountains (Artemiev, 1978: 25).

Phlebotomus* (*Euphlebotomus*) *kiangsuensis Yao & Wu

(Map 12)

Phlebotomus kiangsuensis Yao & Wu, 1938: 527 [♀ ♂]. Holotype ♂, CHINA (CFHS, Nanking?).
Phlebotomus (*Euphlebotomus*) *kiangsuensis* Yao & Wu; Lewis, 1978*b*: 244 [synonymy].

DISTRIBUTION. **China, Taiwan and West Malaysia**: Lewis (1978: 245). **China**: Leng (1978: 7, no. 10 on map).

Phlebotomus* (*Euphlebotomus*) *mesghalii Rashti & Nadim

(Map 12)

Phlebotomus (*Euphlebotomus*) *mesghalii* Rashti & Nadim, 1970: 145 [♀ ♂]; Artemiev, 1978: 24. Holotype ♂, IRAN (IPH, Tehran).

In the original description the names *mesghali* and *mesghalii* were both used, obviously for the same taxonomic unit. As first reviser, within the meaning of ICZN (1964), Article 24 (a) (i), I here select *mesghalii* as the name which will ensure stability of nomenclature.

A possible variant in Afghanistan is provisionally classed as species 2 by Artemiev (1978: 25).

Phlebotomus* (*Euphlebotomus*) *philippinensis Manalang

Phlebotomus philippinensis Manalang, 1930: 175.

Phlebotomus* (*Euphlebotomus*) *philippinensis gouldi Lewis

(Map 12)

Phlebotomus (*Euphlebotomus*) *philippinensis gouldi* Lewis, 1978*b*: 245 [♀ ♂]. Holotype ♀, THAILAND (BMNH) [examined].

Phlebotomus* (*Euphlebotomus*) *philippinensis philippinensis Manalang

(Map 12)

Phlebotomus philippinensis Manalang, 1930: 175 [♀ ♂]. Syntypes ♀ ♂, PHILIPPINES (CA, Los Baños (?) but destroyed according to Quate & Rosario, 1962: 787, 789, 791).
Phlebotomus (*Euphlebotomus*) *philippinensis philippinensis* Manalang; Lewis, 1978*b*: 245 [synonymy].

♀ (*extra fact*). Leg formula 100, 133, 89; 111, 155, 100; 111, 178, 111.

DISTRIBUTION. **Philippines**: Lewis (1978*b*: 325, map).

Phlebotomus* (*Euphlebotomus*) *tumenensis Wang & Chang

(Map 12)

Phlebotomus tumenensis Wang & Chang, 1963: 511 [♀ ♂]. Syntypes ♀ ♂, CHINA: Tumen, 31°46′N, 104°06′E (PIPD, Shandong).
Phlebotomus (*Euphlebotomus*) *tumenensis* Wang & Chang; Artemiev, 1979: 19.

Subgenus *ANAPHLEBOTOMUS* Theodor

Phlebotomus subgenus *Anaphlebotomus* Theodor, 1948: 99; Perfil'ev, 1968: 67, 78, 83; Hennig, 1972: 53; Lewis, 1978*b*: 247. Type-species: *Phlebotomus stantoni* Newstead, 1914, by original designation.

Key to the species of subgenus *Anaphlebotomus*

Females

1 Spermatheca long (about eight times as long as wide) and tubular with very long duct. Afrotropical . . . . ***rodhaini*** (p. 170)
– Spermatheca not long and tubular. Oriental 2

2 Spermatheca slightly carrot-shaped with small end-segment, individual duct about four (possibly more) times length of spermatheca.
Sternal tubercle broad . . . . *colabaensis* (p. 171)
– Spermatheca spindle-shaped with very narrow cylindrical apical segment, duct short but common duct very long.
Ascoids long. Palp 3 with peg sensilla grouped around middle 3
3 Pharyngeal armature with antero-median numerous long pointed teeth which blend laterally with ridges. Individual ducts longer than spermathecae . . . . . . *stantoni* (p. 172)
– Pharyngeal armature with several antero-median rows of small short teeth, and antero-laterally a number of backward-pointing teeth. Individual ducts shorter than spermathecae . *hoepplii* (p. 171)

Males

1 Paramere bilobed . . . . *colabaensis* (p. 171)
– Paramere trilobed 2
2 Plunger of sperm pump much wider than body of barrel. Afrotropical . . . . *rodhaini* (p. 171)
– Plunger of sperm pump narrower than body of barrel. Oriental 3
3 Spine near aedeagus not longer than it. Pharynx with a series of oblique ridges radiating from mid-line and ending in loops laterally . . . . *stantoni* (p. 172)
– Spine near aedeagus much longer than it. Pharynx with a series of posterior ridges and, antero-laterally, a number of teeth projecting medio-posteriorly . . . . . . *hoepplii* (p. 171)

Phlebotomus (Anaphlebotomus) colabaensis Young & Chalam

(Map 13)

Phlebotomus colabaensis Young & Chalam, 1927: 859 [♂]. Holotype ♂, INDIA (CSI Kasauli, now in NICD, Delhi?).

Phlebotomus (*Anaphlebotomus*) *colabaensis* Young & Chalam; Lewis, 1978*b*: 247 [references including one to description of ♀ by Sinton in 1933].

Phlebotomus (*Anaphlebotomus*) *colobaensis* Young & Chalam; Artemiev, 1978: 24. [Mis-spelling.]

DISTRIBUTION. **India & Pakistan**: Lewis (1978*b*: 326, map). **India**: Delhi (1979, *S. J. R.*); Modi *et al.* (1977: 3; 1978: 748, map of Maharashtra).

Phlebotomus (Anaphlebotomus) hoepplii Tang & Maa

(Map 13)

Phlebotomus hoepplii Tang & Maa, 1945: 25 [♀♂]. Holotype ♂, CHINA (TM).

Phlebotomus (*Anaphlebotomus*) *hoepplii* Tang & Maa; Lewis, 1978*b*: 247 [references].

DISTRIBUTION. **China**: Leng (1978: 7, no. 9 on map); Lewis (1978*b*: 326, map).

Phlebotomus (Anaphlebotomus) rodhaini Parrot

(Map 13)

Phlebotomus rodhaini Parrot, 1930*a*: 187 [♂]; 1930*b*: 103; Kirk & Lewis, 1947: 875; Heisch & Guggisberg, 1952: 428. Holotype ♂, ZAIRE (MRAC, Tervuren).

Phlebotomus (*Phlebotomus*) *rodhaini* Parrot; Parrot, 1948: 127 [♀]; Kirk & Lewis, 1946*b*: 120; 1951: 437; Minter, 1963: 490; Quate, 1964: 245; Abonnenc & Minter, 1965: 32; Abonnenc, 1967: 70; 1972: 108.

Phlebotomus grenieri Rageau, 1951: 796 [♀]. Syntypes 2 ♀, CAMEROUN (IP, Paris). [Synonymized by Abonnenc, 1967: 70.]

Phlebotomus (*Anaphlebotomus*) *rodhaini* Parrot; Qutubuddin, 1962: 597.

DISTRIBUTION. **Africa**: Abonnenc (1972: 251, map). **Congo**: Vattier-Bernard & Bimangou (1974: 105). **Benin Republic and Togo**: Abonnenc (1973: 190, map). **Ethiopia**: Ashford (1974: 610); Gemetchu *et al.* (1977: 209). **Gambia**: Snow (1979: 245). **Guinea**: Abonnenc & Clastrier (1974: 61). **Kenya**: Minter (1964: 407, map); Kiboko (*D. M. M.*, record of 1980); Wijers & Ngoka (1974: 26). **Senegal**: (1977, *J. P. D.*). **Sudan**: Hoogstraal & Heyneman (1969: 1155); Lewis & Kirk (1954: 35, map); Qutubuddin (1962: 597, Gedaref). **Uganda**: Wykoff *et al.* (1969: 206).

NOTE. This species apparently feeds mainly on rodents (Abonnenc, 1972: 110) and has been known to bite man (Ashford, 1974: 610; Ashford *et al.*, 1973: 261; Hoogstraal & Heyneman, 1969: 1156, 1170).

***Phlebotomus* (*Anaphlebotomus*) sp. D**

(Map 13)

This species is being described by Dr I. H. Davidson.

Phlebotomus* (*Anaphlebotomus*) *stantoni Newstead

(Map 13)

Phlebotomus stantoni Newstead, 1914: 190 [♀]; Leng, Liu, Huang & Liu, 1979: 189. Holotype ♀, WEST MALAYSIA (BMNH) [examined].

Phlebotomus (*Anaphlebotomus*) *stantoni* Newstead; Lewis, 1978*b*: 248 [synonymy including *maynei* as synonym and description of ♂ *P. stantoni* by Raynal in 1934].

DISTRIBUTION. **China and Orient**: Lewis (1978*b*: 326, map). **China**: Leng (1978: 7, no. 8 on map); Leng *et al.* (1979: 189, Ch'ang-chiang (= Zhanjiang)).

Subgenus ***KASAULIUS* subgen. n.**

Type-species: *Phlebotomus newsteadi* Sinton.

DIAGNOSIS. Pharynx of ♀ with well-developed teeth pointing backward. Antenna 3 long, 0·39 mm or more in ♀ and 0·52 or more in ♂; two ascoids on segments 3–15 in ♀, and 3–10 in ♂. Palp formula 1 (2, 4), 3, 5 in ♀ and 1, (4, 2), 3, 5 in ♂. Mesanepisternum with two lower hairs. Legs very long, in ♂ tibia 3 = 2·18, and basitarsus 3 = 1·36, as long as femur 1. Wing narrow, in ♀ about 4·3, and in ♂ 4·7, as long as wide; index 1·94–2·14 in ♀ and 1·5–2·3 in ♂. Haltere of ♂ with broad stalk, hind half marked off by a furrow and having a projecting group of large sensilla. Spermatheca moniliform with about 25 segments, the end one large. Genital filaments about twice length of pump. Aedeagus narrow, with two accompanying pointed rods. Paramere with truncated end having four small ventral serrations, a few hairs on a small projection, and an accessory spine. Coxite without group of hairs. Style with five spines.

DISCUSSION. Theodor (1948: 108) placed the single species provisionally in the subgenus *Euphlebotomus* although the description of the paramere did not indicate this, and Artemiev (1979: 19) considered that *P. newsteadi* was closest to *Euphlebotomus* in view of the lateral spine of the aedeagus and the shape of the paramere, coxite and style. The unique nature of this species is emphasized by its narrow wings and by comparison of its leg-segments with those of other species, and a new subgenus is therefore proposed for it. It is given a territorial name because *P. newsteadi*, though discovered 60 years ago, is known only from the one place.

Phlebotomus* (*Kasaulius*) *newsteadi Sinton

(Map 13)

Phlebotomus newsteadi Sinton, 1926: 559 [♂]; Lewis, 1978*b*: 250 [synonymy including description of ♀ by Sinton in 1928]; Artemiev, 1978: 24; 1979: 19 [related to *Euphlebotomus*?]. Lectotype ♂, INDIA (BMNH), designated by Lewis, 1978*b*: 250 [examined].

♂ (*extra facts*). Labrum 0·28 mm long, 0·59 length of head, 0·09 length of wing. Antenna 4 and 5 with papilla. Two lower mesanepisternal hairs present. Leg formula 100, 176, 119; 93, 194, 125; 106, 218, 136 (3·03, 0·20). Wing length 2·93 (2·84–3·03) mm long, 4·7 times width. Haltere shaft 0·19 length of wing.

MATERIAL EXAMINED

India: 1 ♂, Kasauli, 5.viii.1928, garden house (*J. A. S.*) (RSTMH, London).

NOTE. The rarity of this species and the relative lengths of the hind tibia and the basitarsi suggest that it may be a cave form seen rarely outside caves.

Nomen nudum

Phlebotomus algeriensis Jenkins, 1964: 31.

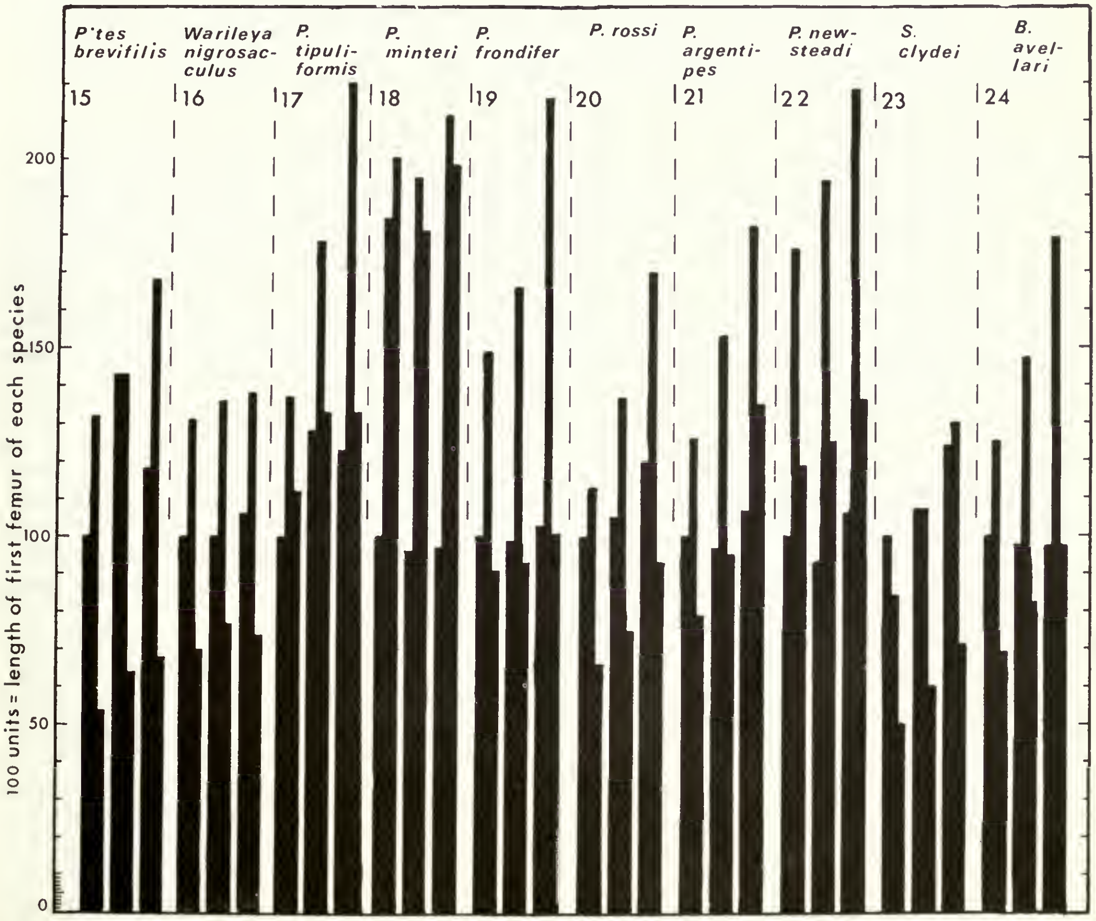
Discussion

Leg ratios (Figs 15–24)
The relative length of tibia 3 of a species was taken as an indicator of leg length, and species with a tibia 3 length of 165 units or less were classed as short-leg species, and the rest as long-leg species. For estimating the mean lengths in subgenera, figures for species were placed in working groups of 121–130, 131–140 and so on.

Phlebotomites brevifilis Hennig (120 MYA)
The leg formula appears to be 100, 132, 53; 143, 143, 64; 117, 168, 68 (0·41), with the three tibiae and the basitarsi approaching equality and tibia 1 and femur 2 very long.

Genus *Warileya*
The leg formula of the male of *W. nigrosacculus* is 100, 132, 70; 100, 136, 72; 106, 138, 74 (0·47), each leg being like the others, and tibia 3 very short. The remarkable degree of uniformity of this species may be related to that shown by the fossil forms.

Genus *Phlebotomus*
Out of 55 species studied the length of tibia 3 ranged from 155 to 218, and there were eight (14 per cent) short-leg species and 47 (86 per cent) long-leg species.



Figs 15–24 The relative lengths of long segments of each leg of 10 species of Phlebotominae.

Phlebotomus tipuliformis (Meunier) (30 MYA). The leg formula (Hennig, 1972: 52) appears to be 100, 137, 112; 128, 178, 133; 123, 220, 133 (0·49). All tibiae are long and tibia 3 very long, and the basitarsi longer than the femora and about equal to each other. If the measurements of flies in amber are reliable the two fossil species show a tendency to uniformity.

Subgenus *Spelaeophlebotomus.* One species was measured. Tibia 3 = 211. All tibiae and basitarsi are very long, probably as an adaptation to caves.

Subgenus *Idiophlebotomus.* Six species were measured. Tibia 3 = 197 (182–216). The tibiae and basitarsi show a tendency to uniformity, probably a primitive feature. Femur 1 is always longer than femur 2, and this and the long tibia 3 may represent an adaptation to life in caves.

Subgenus *Australophlebotomus.* Two species were measured. Tibia 3 = 155 (155–156).

Subgenus *Phlebotomus.* Four species were measured. Tibia 3 = 171 (163–175).

Subgenus *Paraphlebotomus.* Eight species were measured. Tibia 3 = 172 (153–194). In *P. alexandri* each tibia is shorter than in other species, and basitarsus 1 is shorter than femur 1 (longer in all other species). All the tibiae of *P. nuri* are longer than those of other species studied. Measurements of *P. sergenti* from Corsica and Morocco (Croset *et al.*, 1974: 107) and the U.S.S.R. indicate local variation.

Subgenus *Synphlebotomus.* Six species were measured. Tibia 3 = 165 (157–172) and there is little specific variation.

Subgenus *Larroussius.* Seventeen species were measured. Tibia 3 = 181 (147–212), one being below 150 and two above 200.

Subgenus *Adlerius.* Six species were measured. Tibia 3 = 182 (163–202).

Subgenus *Euphlebotomus.* Three species were measured. Tibia 3 = 180 (176–185).

Subgenus *Anaphlebotomus.* Four species were measured. Tibia 3 = 179 (167–189).

Subgenus *Kasaulius.* In the one species tibia 3 = 218.

Other genera

Records of 27 species of *Sergentomyia* show a variation of 124–229 in the length of tibia 3, even in this small sample, with 18 short-leg and nine long-leg species. Published records of three species of *Brumptomyia* show an average length of 184 (178–190) for tibia 3. Published records of 100 species, of 30 subgeneric groups, of *Lutzomyia* give a tibia 3 length of 136 to 230 units, with 42 short-leg and 58 long-leg species. Among groups represented by five or more species, the number of species considered and the mean length of tibia 3 were: *Psychodopygus* Mangabeira, 8, 169; *Pressatia* Mangabeira, 5, 161; *Helcocyrtomyia* Barretto, 9, 172; *Psathyromyia* Barretto, 7, 196; *verrucarum*-group, 10, 155.

Conclusion

The records for *P. papatasi* and *P. caucasicus* suggest that leg measurements differ little between the sexes, and the former shows little variation in a particular area. Extinct and some primitive species (*Phlebotomites, Warileya, P. tipuliformis, Spelaeophlebotomus* and *Idiophlebotomus*) show a trend towards equality of segment 1, 2 or 3 in successive legs. Most species of *Phlebotomus* show a pattern in which each femur, tibia and basitarsus is longer than the preceding one, and each tibia is somewhat longer, and each basitarsus much shorter, than its femur.

The length of tibia 3 in *Phlebotomus* tends to be greater than in *Sergentomyia* and *Brumptomyia*, and varies more than in *Brumptomyia* and less than in *Sergentomyia.* In all three genera the length of tibia 3 apparently constitutes a more or less clear-cut feature of several subgeneric groups, and in the case of *Kasaulius* it was a factor in deciding to treat this group as a subgenus. Certain species can be distinguished from others by the length of tibia 3. Some species with a similar tibia 3 length differ in the form of another leg, which may be useful if the others are missing. It is therefore worth while to examine all three legs, and to follow up differences suggested by leg diagrams. Infra-specific local variation seems to occur in at least one species (*P. sergenti*). These findings suggest that the measurement of all long leg segments of at least one female of a sandfly species yields enough information to be worth doing. Further work could provide averages instead of measurements of individual flies, indicate the length of tibia 3 in additional species, and evaluate any apparently distinctive specific characters.

Evolution of Phlebotominae

It is now possible to speculate on the history of *Phlebotomus* and some other sandflies on the basis of fossils, palaeogeography, morphology and distribution. The following remarks refer to the Old World unless the New is mentioned.

Old and New World sandfly faunas

Before 120 MYA Phlebotominae had probably lived for a long time in Pangaea, and possibly fed on insects before taking to vertebrate blood (Rohdendorf, 1974: 58). After the opening of the south Atlantic about that time the two sandfly faunas of Africa and South America probably evolved separately. It is not known whether this separation continued to the present day, because the north Atlantic did not open (Papavero, 1977: 212) till perhaps 60 MYA or later, there were probably land connections in the Bering area and elsewhere from time to time, and the effects of past polar and climatic changes on sandfly distribution are unknown. After the development of *Phlebotomus* its species probably did not extend far enough into the cold north to cross the Bering land bridge (Perfil'ev, 1968: 90). The present differences between Old and New World sandflies, though somewhat indefinite, are enough to suggest that isolation has prevailed for the last 120 MYA.

The proboscis in relation to reptile and mammalian hosts

According to present evidence nearly all living species of sandflies are either reptile or mammal feeders. In general the reptile feeders are distinguished morphologically as ridge-tip species, according to the shape of the maxilla and other stylets, and have a short labrum, not more than 0·23 mm long (Lewis, 1975: 507, 520, 525). Mammal feeders are hook-tip species, usually with a labrum 0·24 or more in length. Species of *Sergentomyia* typically have a labrum about 0·11 (0·09–0·14) as long as the wing, and *Phlebotomus* about 0·14 (0·11–0·22) as long, and the difference is usually accentuated by the greater size of species of *Phlebotomus*. Current studies on the mouth parts of early fossil-piercing psychodids, living in the age of reptiles and presumably ridge-tips, had a short labrum. It is likely that in reptile feeders the labrum has remained short, and that in mammal feeders it has progressively lengthened during the rise of mammals, so that now the two groups have a somewhat midge-like and mosquito-like facies respectively.

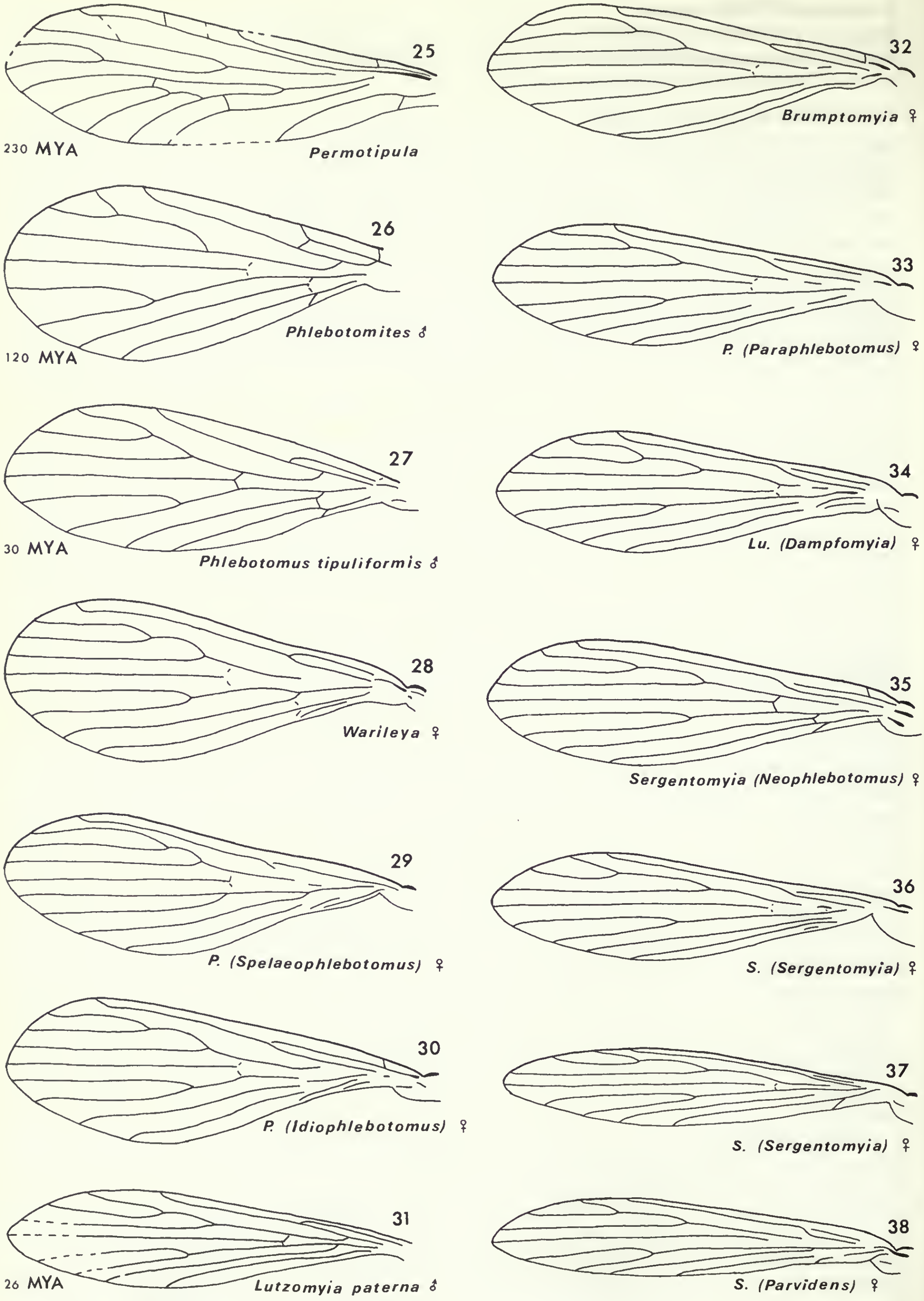
Wing shape

Wings vary from being very broad with round ends to being very narrow with almost pointed tips. There is no clear distinction between narrowly rounded and bluntly pointed tips, but there is generally little difficulty in dividing species as follows among four groups designated by typical values of wing length divided by width, although in a doubtful case a subjective view of shape may be better than exact measurement: very wide (3·2, Figs 26–30), wide (3·5, Figs 32–35), narrow (3·9 Fig. 36) and very narrow (5·5, Figs 37, 38).

Very wide wings are seen in *Phlebotomites* species and *Phlebotomus tipuliformis*, in the primitive *Warileya*, in the subgenera *Spelaeophlebotomus* and *Idiophlebotomus*, and in some species of subgenus *Australophlebotomus*. Except in this subgenus the wings are of a primitive type with the origin of R_4 near that of R_5 so that gamma is short (Abonnenc, 1972: 75). The closely related *Spelaeophlebotomus* and *Idiophlebotomus* share an archaic wing structure (Abonnenc, 1972: 74, 75). An interocular suture (Young, 1979: 5), presumably a primitive character, occurs (Lewis *et al.*, 1977: 326) in *Warileya* and *Spelaeophlebotomus*. *Idiophlebotomus* and most species (Young & Chaniotis, 1973; Lewis *et al.*, 1977: 325) of *Warileya* share the unusual feature of rods near the sperm pump.

In all other phlebotomines the origin of R_{2+3} has become distally displaced, the wing less wide, and its tip less rounded, possibly in relation to the development of a hairy fringe (Hennig, 1972: 8, 27). The first known narrowing occurred, in America, at least 26 MYA.

The wing tends to be wide, with R_2 longer than R_{2+3} (Theodor, 1958: 24, 33, 48; Perfil'ev, 1968: 26, more or less oval) in *Phlebotomus*, in subgenus *Neophlebotomus* França & Parrot and some ungrouped and other species of *Sergentomyia*, and in *Brumptomyia* and *Lutzomyia*. Included in *Phlebotomus* are the pair of closely related subgenera *Euphlebotomus* and *Anaphlebotomus* which somewhat resemble (Hennig, 1972: 53–55) the ancient *P. tipuliformis*, and their type


25
230 MYA
Permotipula
26
120 MYA
Phlebotomites ♂
27
30 MYA
Phlebotomus tipuliformis ♂
28
Warileya ♀
29
P. (Spelaeophlebotomus) ♀
30
P. (Idiophlebotomus) ♀
31
26 MYA
Lutzomyia paterna ♂
32
Brumptomyia ♀
33
P. (Paraphlebotomus) ♀
34
Lu. (Dampfomyia) ♀
35
Sergentomyia (Neophlebotomus) ♀
36
S. (Sergentomyia) ♀
37
S. (Sergentomyia) ♀
38
S. (Parvidens) ♀

Figs 25–38 Wings of *Permotipula* and of examples of 13 groups of Phlebotominae to illustrate evolutionary trends.

of spermathecal duct suggested to Perfil'ev (1968: 83) that they are transitional between *Sergentomyia* and *Phlebotomus*. Their long parameral spines and those of *Kasaulius* may (Artemiev, 1979: 18) be homologous with the intra-abdominal rods of the primitive *Warileya* and *Idiophlebotomus*. In three subgenera of the wide-wing group, *Synphlebotomus*, *Euphlebotomus* and *Anaphlebotomus*, the mean length of the labrum is less than in *Phlebotomus*, *Paraphlebotomus*, *Larroussius* and *Adlerius*, and may indicate an earlier stage in evolution.

The wing is often narrow, lanceolate and nearly pointed, with R_2 shorter than R_{2+3} (Fairchild, 1955: 183; Theodor, 1958: 4; Perfil'ev, 1968: 26, 27, 295) in subgenera *Sintonius* Nitzulescu, *Grassomyia* Theodor, *Sergentomyia*, *Parrotomyia* Theodor and some ungrouped species of genus *Sergentomyia*.

Very narrow wings are seen in a few species of genus *Sergentomyia*.

It appears that the phlebotomine wing has gradually narrowed, particularly in *Sergentomyia* and mainly in its savanna species, so that now in the Old World reptile and mammal feeders usually have narrow and wide wings respectively.

Widespread and northern groups of Phlebotomus

If distribution is considered in relation to the above discussions on labrum length and wing shape it is possible to postulate two evolutionary groups of *Phlebotomus*, the widespread and northern groups. The former includes all except subgenus *Phlebotomus* and virtually all *Paraphlebotomus*, *Adlerius* and *Larroussius*, and the latter group comprises most species of these subgenera.

The widespread group shows a number of primitive or apparently primitive features, and in general is widely distributed (Maps 1, 5, 12, 13). The northern group seems to exhibit the ultimate stage in lengthening of the labrum, and has an extraordinarily north-western and restricted distribution in the Old World (Lewis, 1974: 364; 1978*a*: 97; Maps 2–4, 6–11) in relation to other Phlebotominae (the widespread group and *Sergentomyia*, Map 1), with little specific variation in distribution. It corresponds roughly with the distribution of moles, hedgehogs and jerboas (Bartholomew *et al*., 1911) and also (Ellerman, 1950) of the gerbil genera *Meriones*, *Psammomys* and *Rhombomys* with which some sandflies are associated. Gerbils appeared late in geological time (Chaline, 1977) like many rodents (Petrishcheva, 1971: 569). The large northern group includes most of the Old World vectors of mammalian leishmaniasis.

It is suggested that the northern group increased in numbers of individuals, and in species except in subgenus *Phlebotomus*, in late geological times in the north-west, and that during the pluvial periods (Banister & Clarke, 1977: 147, 151; Roberts, 1975: 276) a few species extended into Ethiopia, Yemen and China. *P. orientalis*, closely related to the Mediterranean *P. langeroni*, may be a product of this process, and its present extension into the Sudan, but not far into West Africa (Map 8), could be a stage in its progress. In China species of *Phlebotomus* (Maps 3, 4, 10) may now be cut off from the west unless there is a connection along a corridor south of Mongolia (Perfil'ev, 1968: 96). Further spread of the northern cold-winter group may have been prevented by climatic factors and by natural barriers like the Sahara which has existed for a long time (Corbet, 1967: 334). The distribution of *P. papatasi* and *P. duboscqi* differs somewhat from that of the others, their subgenus is unusually small, and (Hennig, 1972: 53) they may be related to *Euphlebotomus*, so their history may possibly be different.

Aspects of leishmanial evolution in relation to that of Phlebotominae

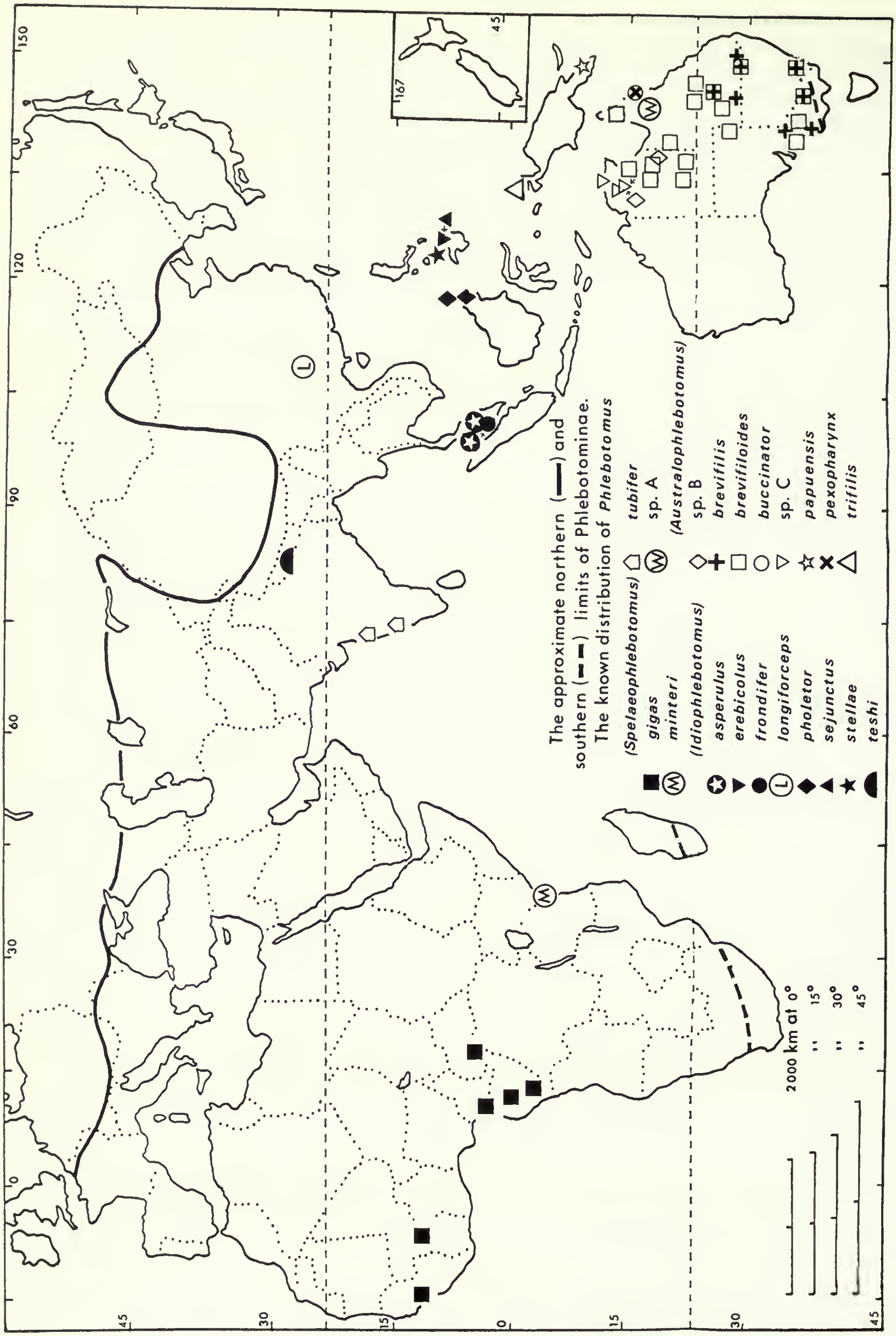
The availability of a few sandfly fossils and knowledge of the present distribution of leishmaniasis make it possible to speculate, as follows, on the history of *Leishmania* in a way that may have some bearing on the classification of the genus.

Before 120 MYA

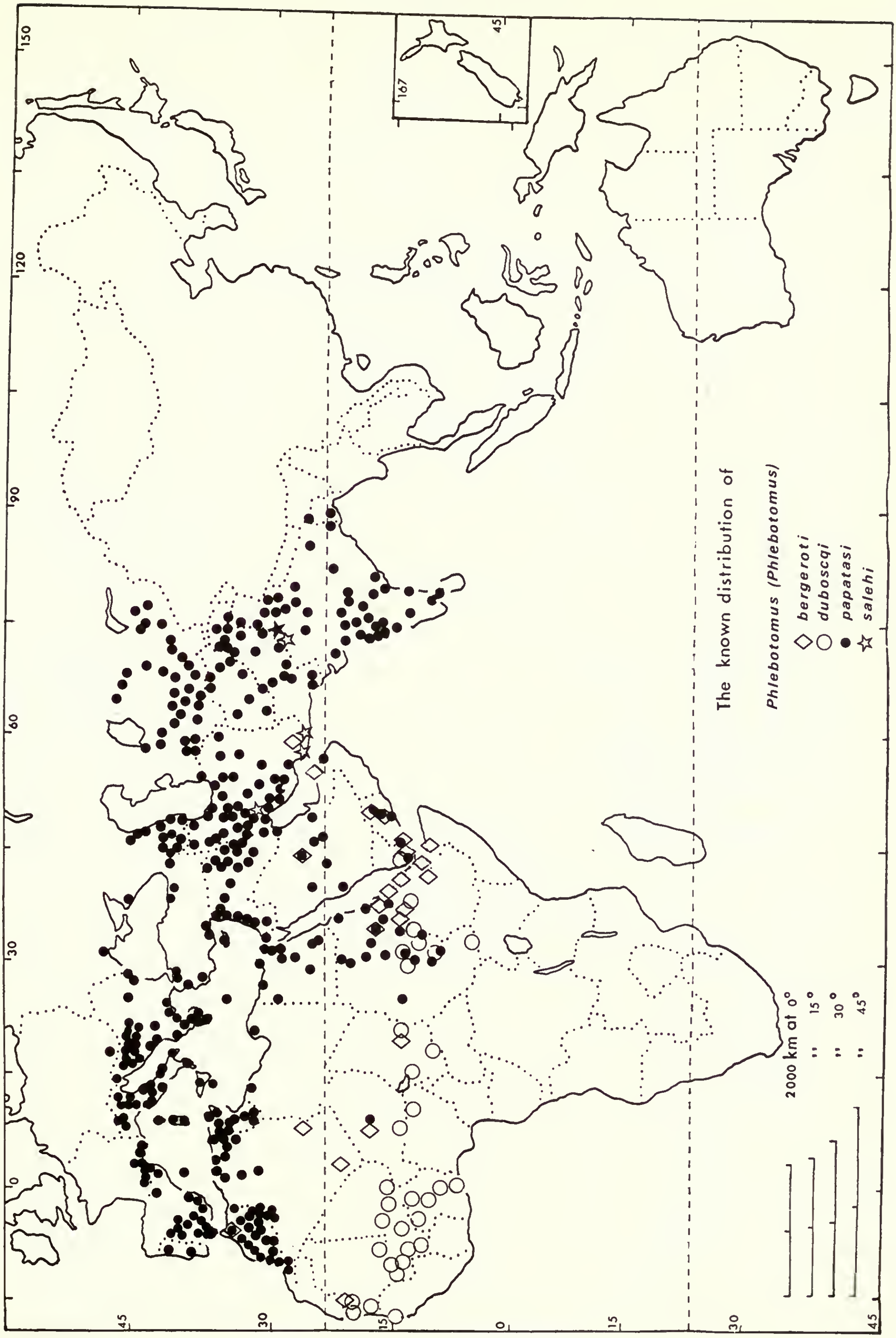
In the ancient continent of Pangaea Phlebotominae may have acted as primary hosts of leishmaniae of reptiles for a long period.

120 to 20 MYA

In the New World some 120 MYA leishmaniae probably began to evolve in isolation from the Old Word, and this separation may have been continuous, or nearly so, till historic times and accounted for the considerable difference (Chance *et al*., 1977: 59) between the parasites of Old

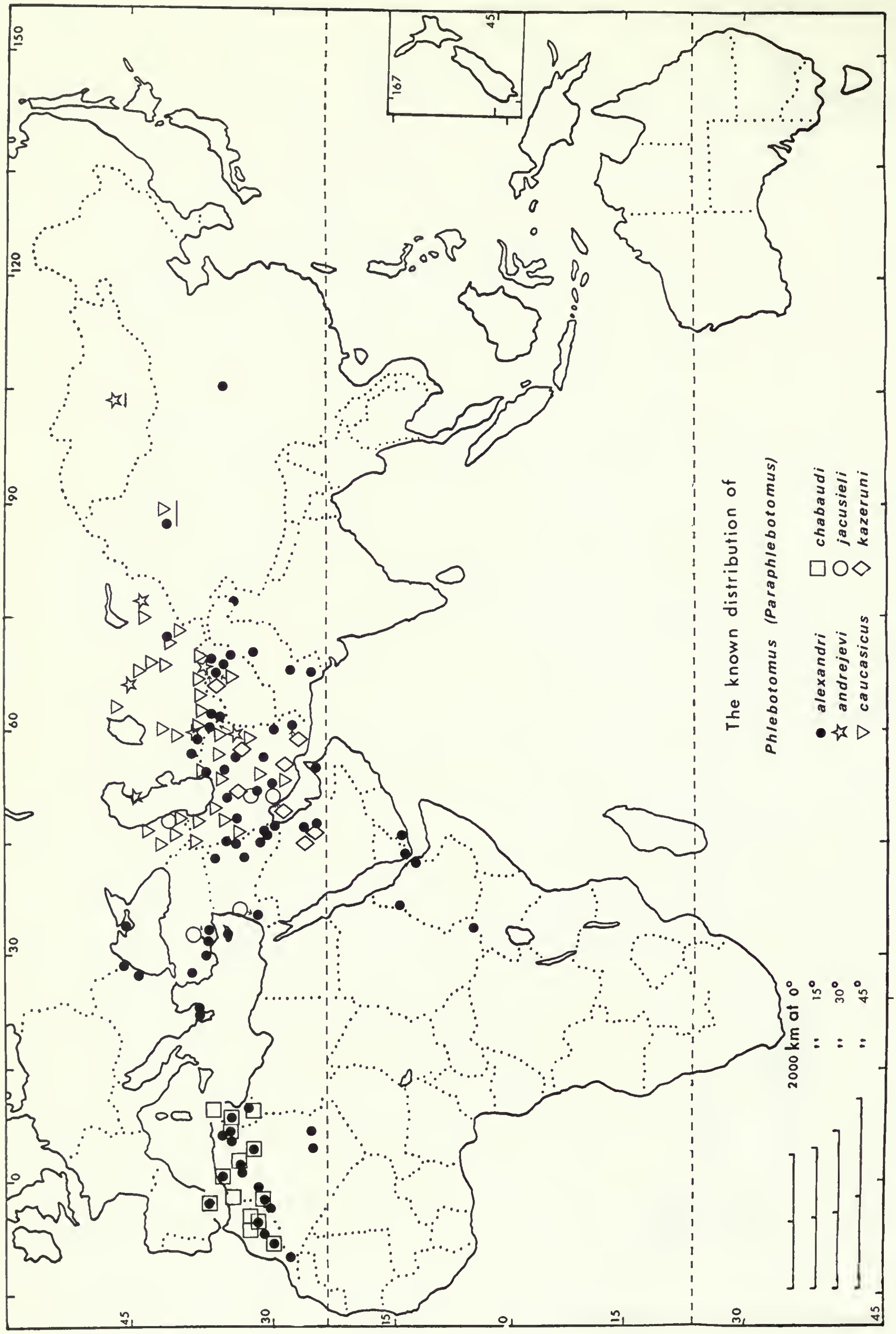

The approximate northern (——) and southern (▬ ▬) limits of Phlebotominae.
The known distribution of *Phlebotomus*
(*Spelaeophlebotomus*)
■ *gigas*
Ⓜ *minteri*
(*Idiophlebotomus*)
✪ *asperulus*
▶ *erebicolus*
● *frondifer*
Ⓛ *longiforceps*
◆ *pholetor*
▲ *sejunctus*
★ *stellae*
◗ *teshi*
⌂ *tubifer*
Ⓦ sp. A
(*Australophlebotomus*)
◇ sp. B
✚ *brevifilis*
□ *brevifiloides*
○ *buccinator*
▷ sp. C
☆ *papuensis*
✖ *pexopharynx*
△ *trifilis*
2000 km at 0°
15°
30°
45°
150
120
90
60
30
0
45
30
15
0
15
30
45
167
45
L
M
W

Map 1


◇ bergeroti
○ duboscqi
● papatasi
☆ salehi
2000 km at 0°
" 15°
" 30°
" 45°
150
120
90
60
30
0
45
30
15
0
15
30
45
167
45

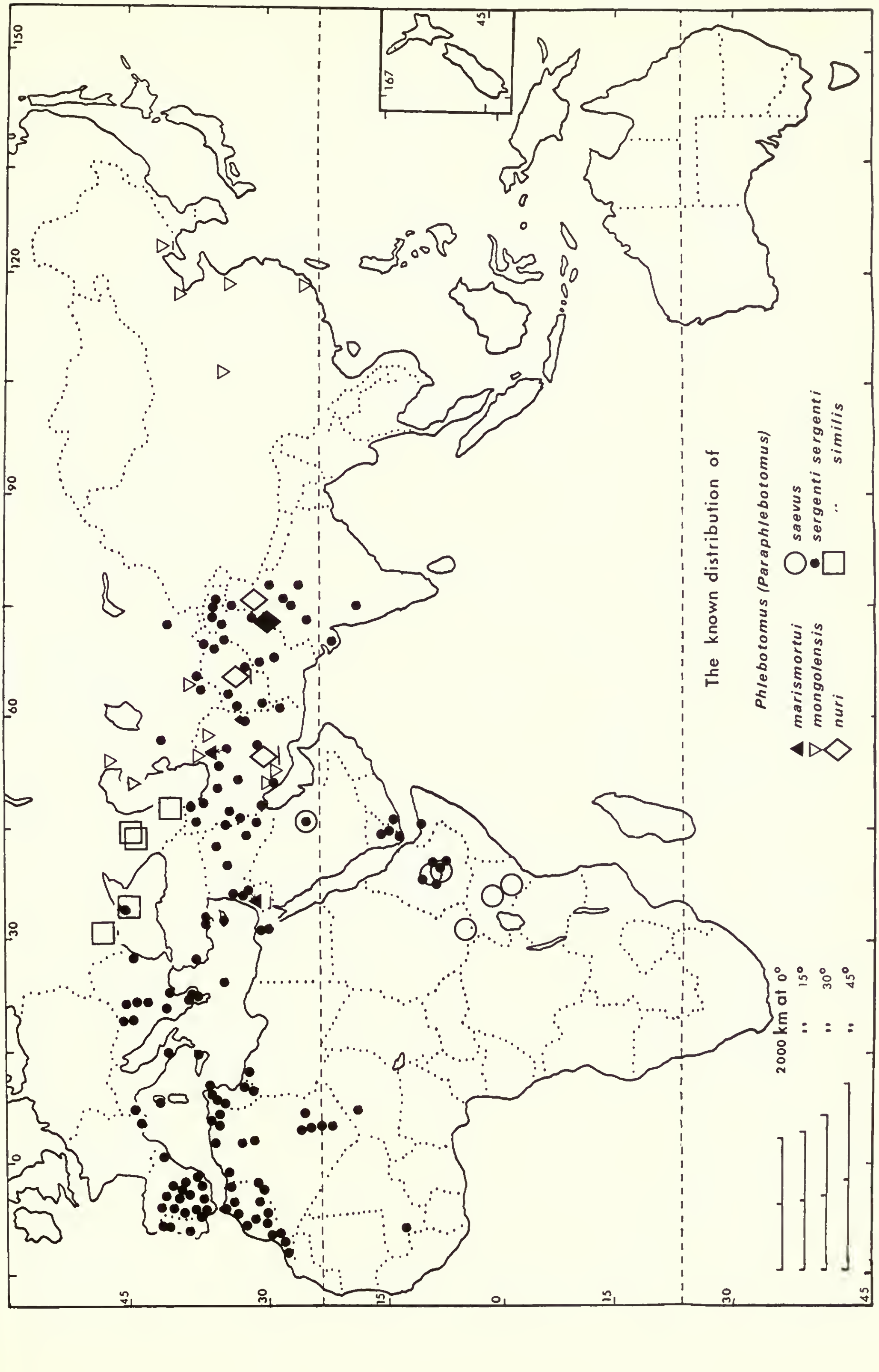
The known distribution of *Phlebotomus (Phlebotomus)*

Map 2

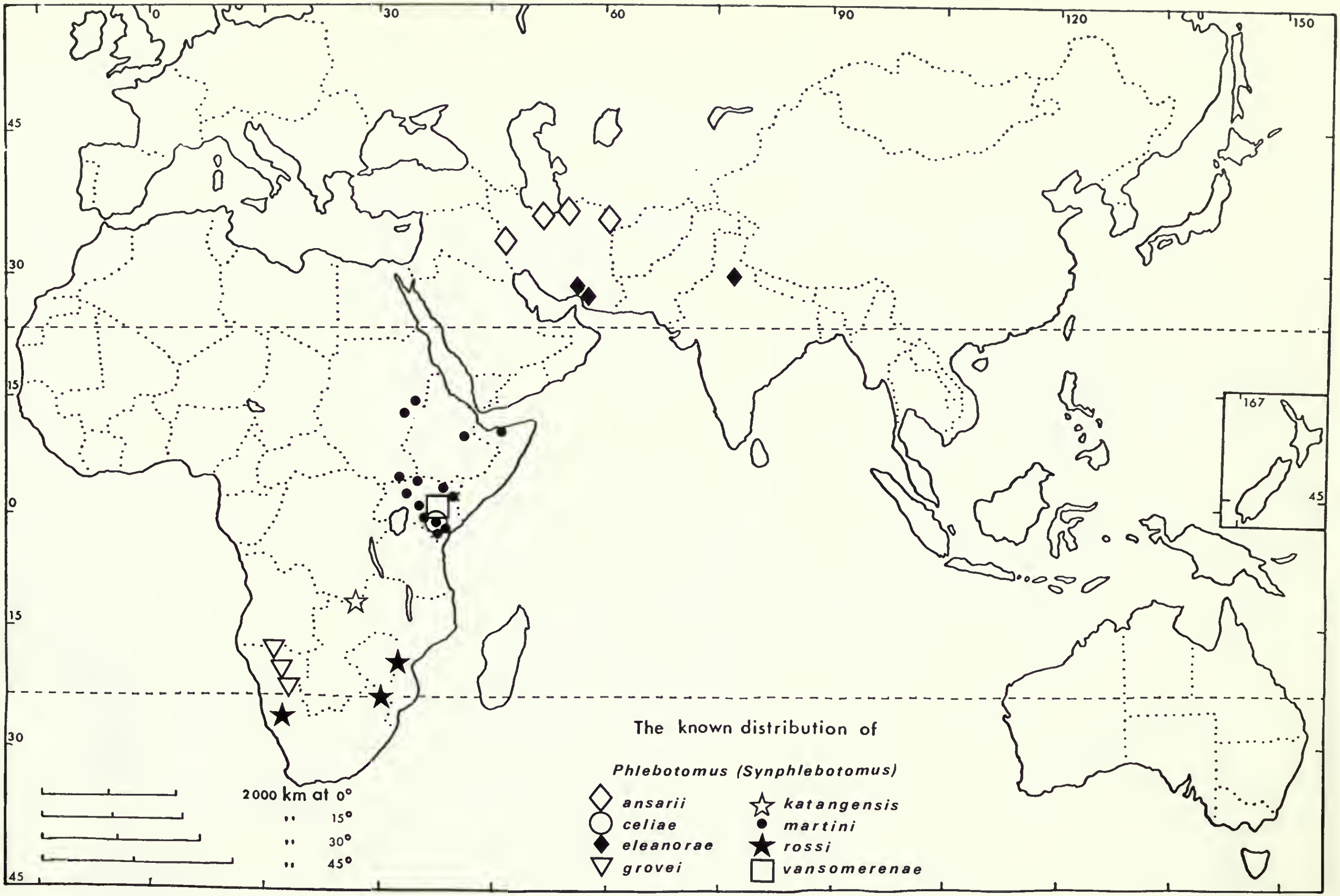

● alexandri
☆ andrejevi
▽ caucasicus
□ chabaudi
○ jacusieli
◇ kazeruni
2000 km at 0°
" 15°
" 30°
" 45°
150
120
90
60
30
0
45
30
15
0
15
30
45
167
45

The known distribution of *Phlebotomus (Paraphlebotomus)*

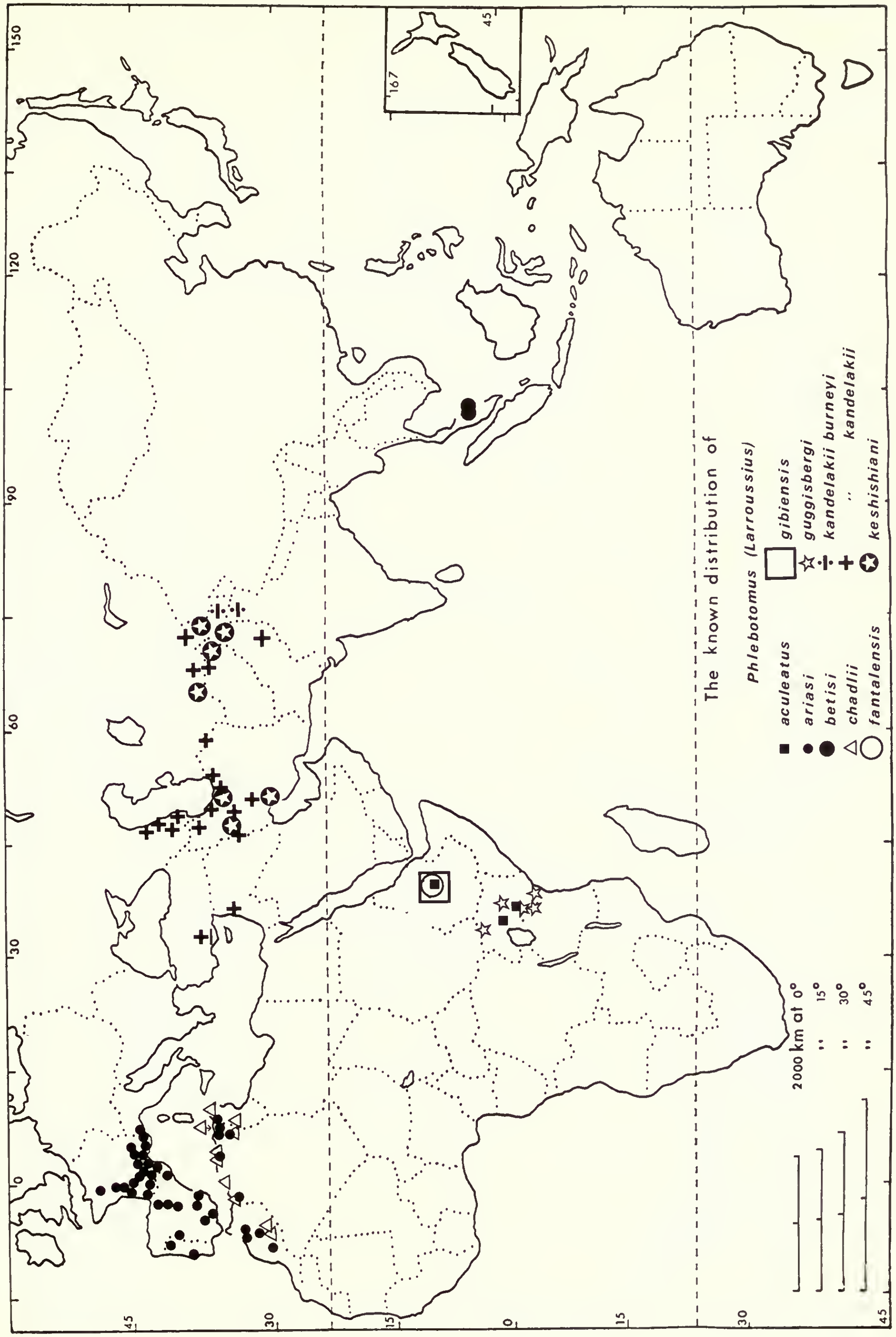
Map 3


The known distribution of
Phlebotomus (Paraphlebotomus)
▲ *marismortui*
▽ *mongolensis*
◇ *nuri*
○ *saevus*
● *sergenti sergenti*
□ ,, *similis*
2000 km at 0°
,, ,, 15°
,, ,, 30°
,, ,, 45°
150
120
90
60
30
10
45
30
15
0
15
30
45
167
45

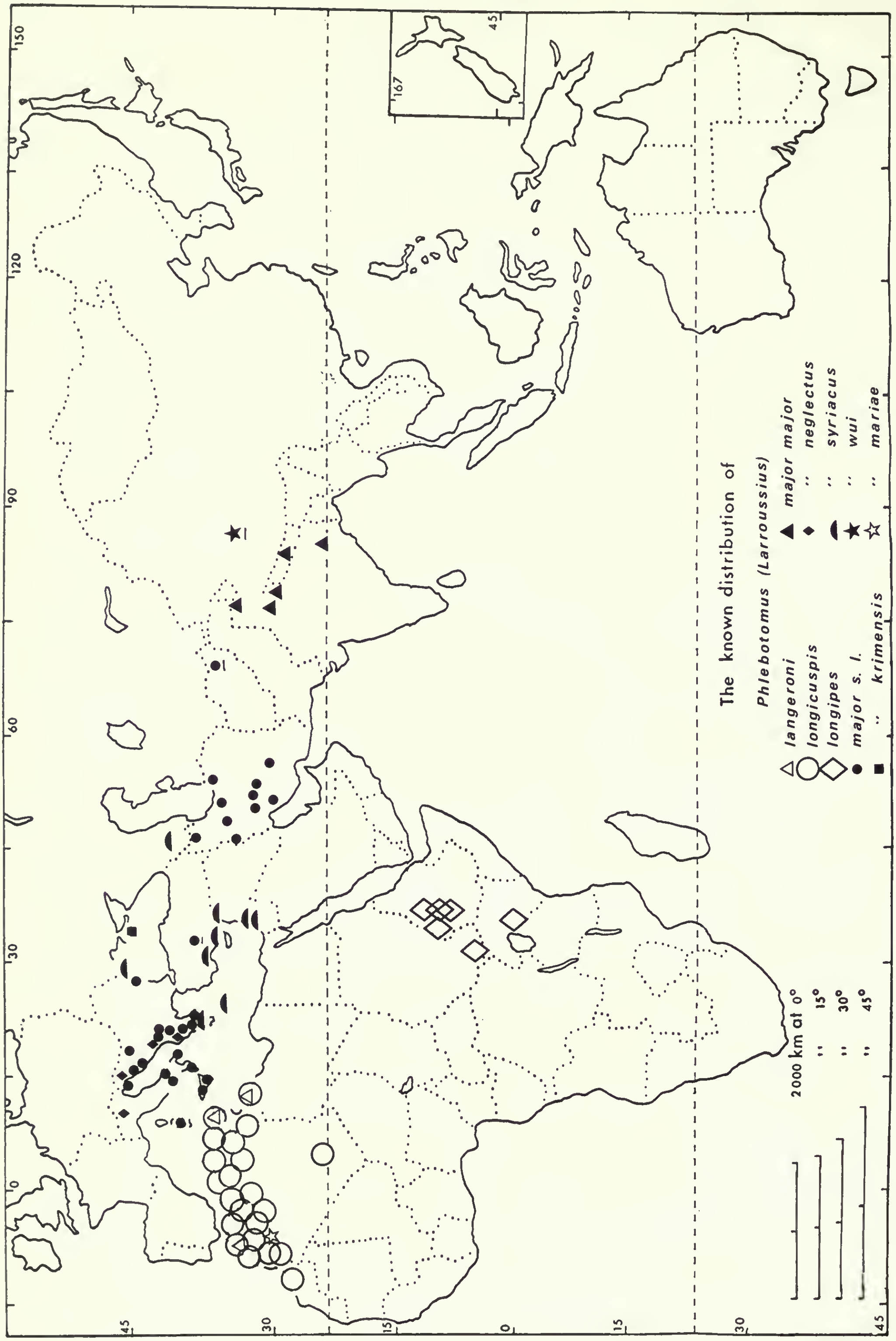
Map 4


The known distribution of
Phlebotomus (Synphlebotomus)
◇ ansarii
○ celiae
◆ eleanorae
▽ grovei
☆ katangensis
● martini
★ rossi
□ vansomerenae
2000 km at 0°
" 15°
" 30°
" 45°
0
30
60
90
120
150
45
30
15
0
15
30
45
167
45

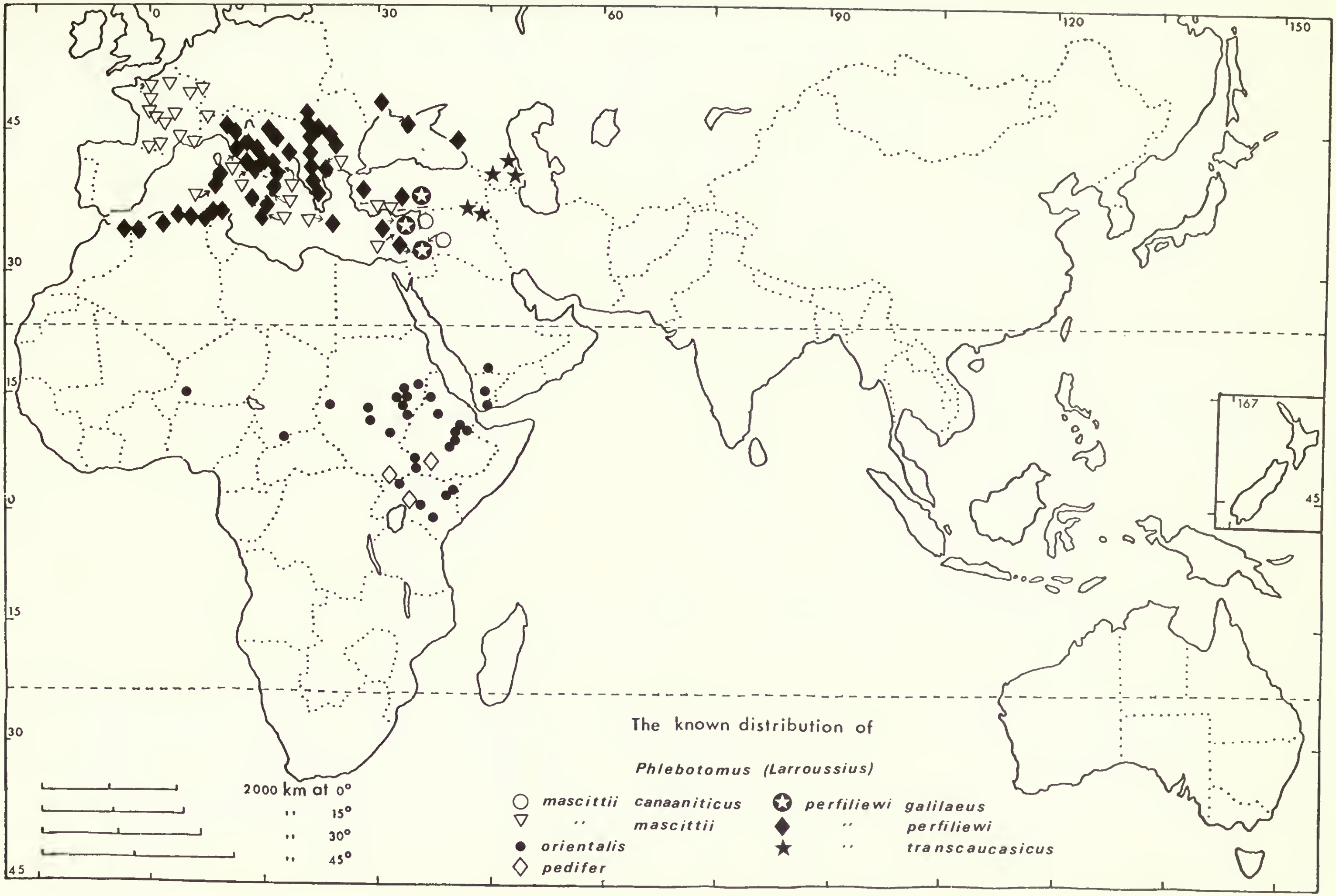
Map 5


The known distribution of
Phlebotomus (*Larroussius*)
■ aculeatus
● ariasi
● betisi
△ chadlii
○ fantalensis
□ gibiensis
☆ guggisbergi
÷ kandelakii burneyi
+ " kandelakii
✪ keshishiani
2000 km at 0°
" 15°
" 30°
" 45°
150
120
90
60
30
0
45
30
15
0
15
30
45
167
45

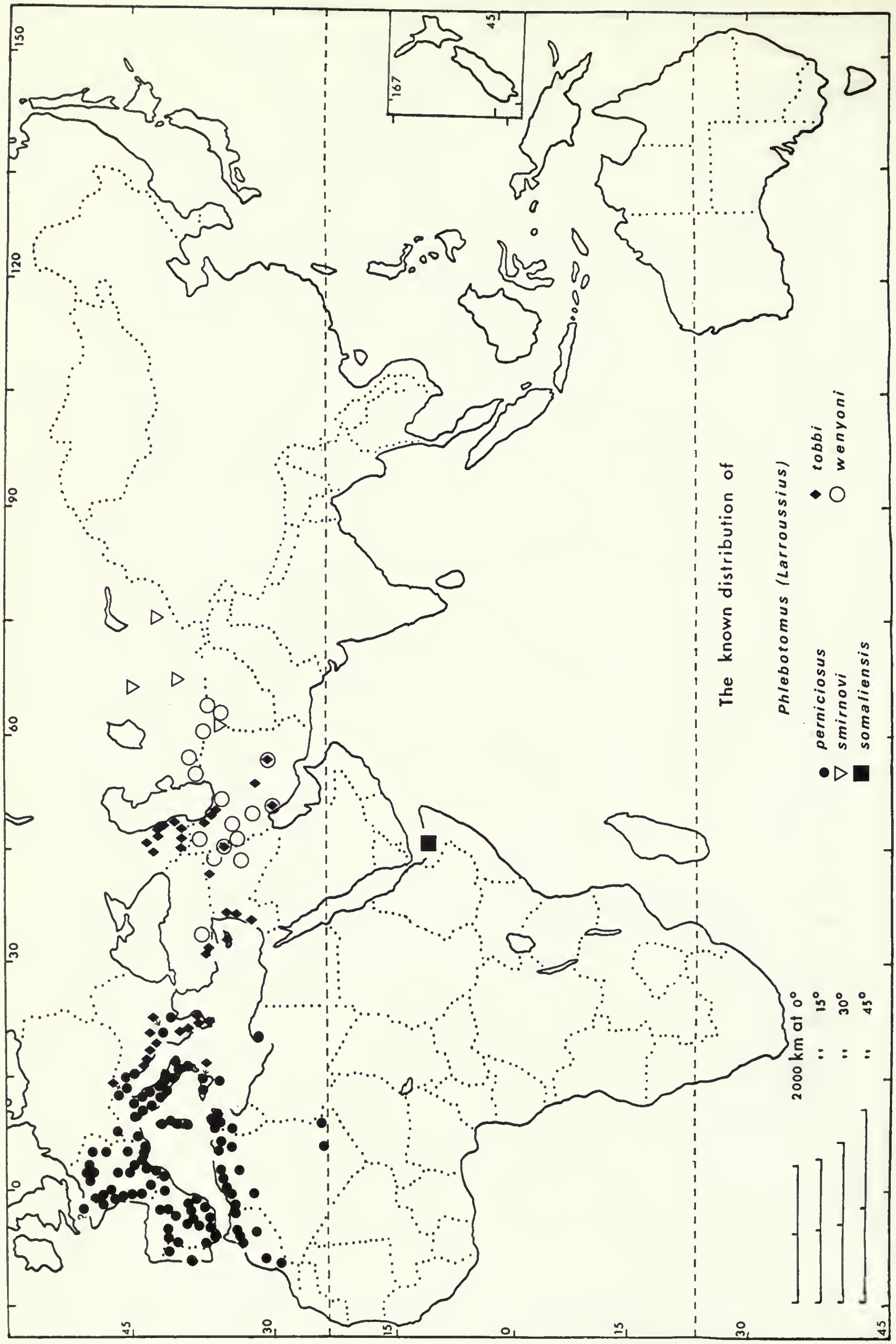
Map 6


The known distribution of
Phlebotomus (Larroussius)
△ langeroni
○ longicuspis
◇ longipes
● major s. l.
■ :: krimensis
▲ major major
◆ :: neglectus
◖ :: syriacus
★ :: wui
☆ :: mariae
2000 km at 0°
:: :: 15°
:: :: 30°
:: :: 45°
150
120
90
60
30
0
45
30
15
0
15
30
45
167
45
?

Map 7

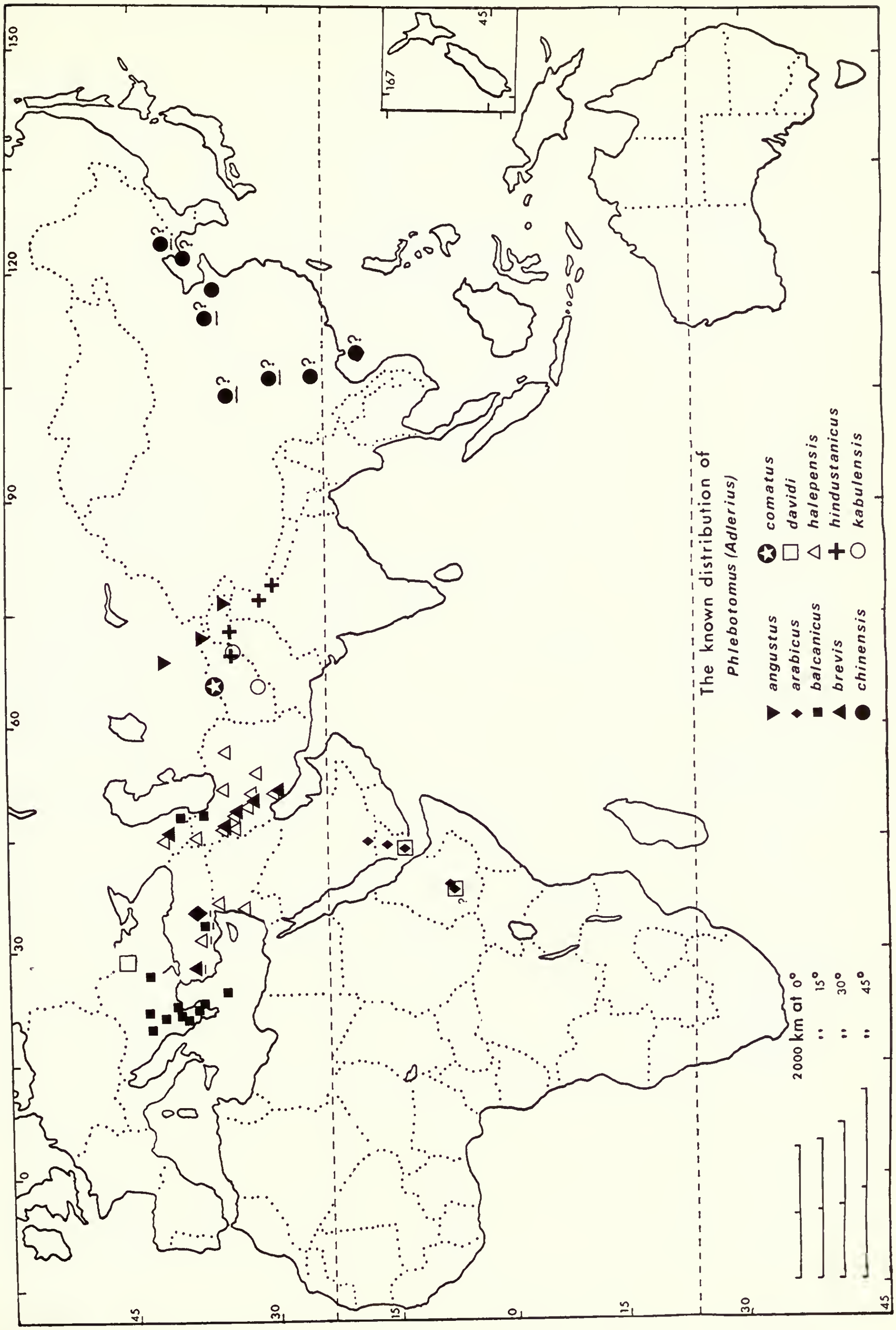

0
30
60
90
120
150
45
30
15
0
15
30
45
167
45
The known distribution of
Phlebotomus (Larroussius)
○ mascittii canaaniticus
▽ " mascittii
● orientalis
◇ pedifer
✪ perfiliewi galilaeus
◆ " perfiliewi
★ " transcaucasicus
2000 km at 0°
" 15°
" 30°
" 45°

Map 8

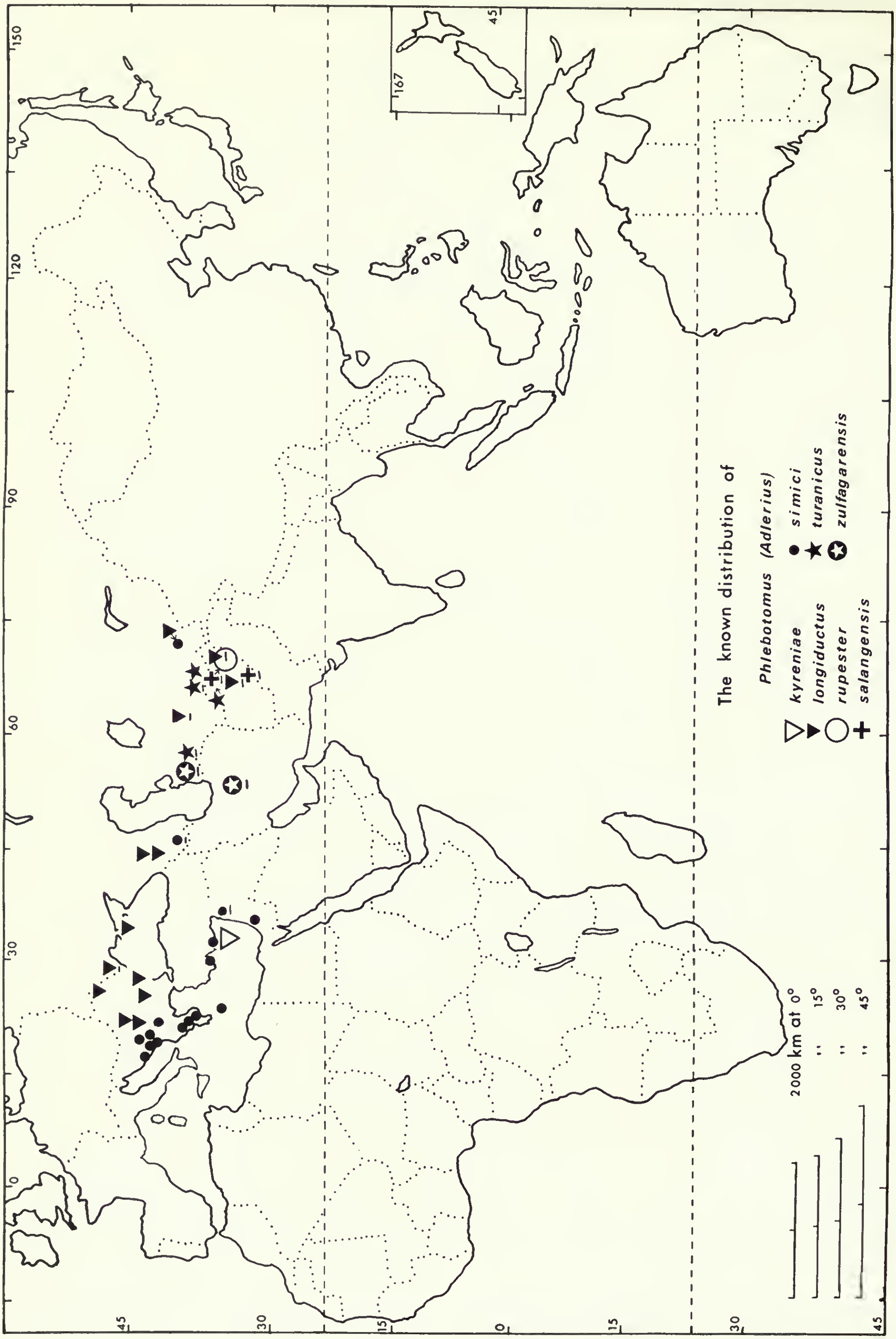

150
120
90
60
30
0
45
30
15
0
15
30
45
167
45
2000 km at 0°
" 15°
" 30°
" 45°
● perniciosus
▽ smirnovi
■ somaliensis
◆ tobbi
○ wenyoni

The known distribution of *Phlebotomus (Larroussius)*

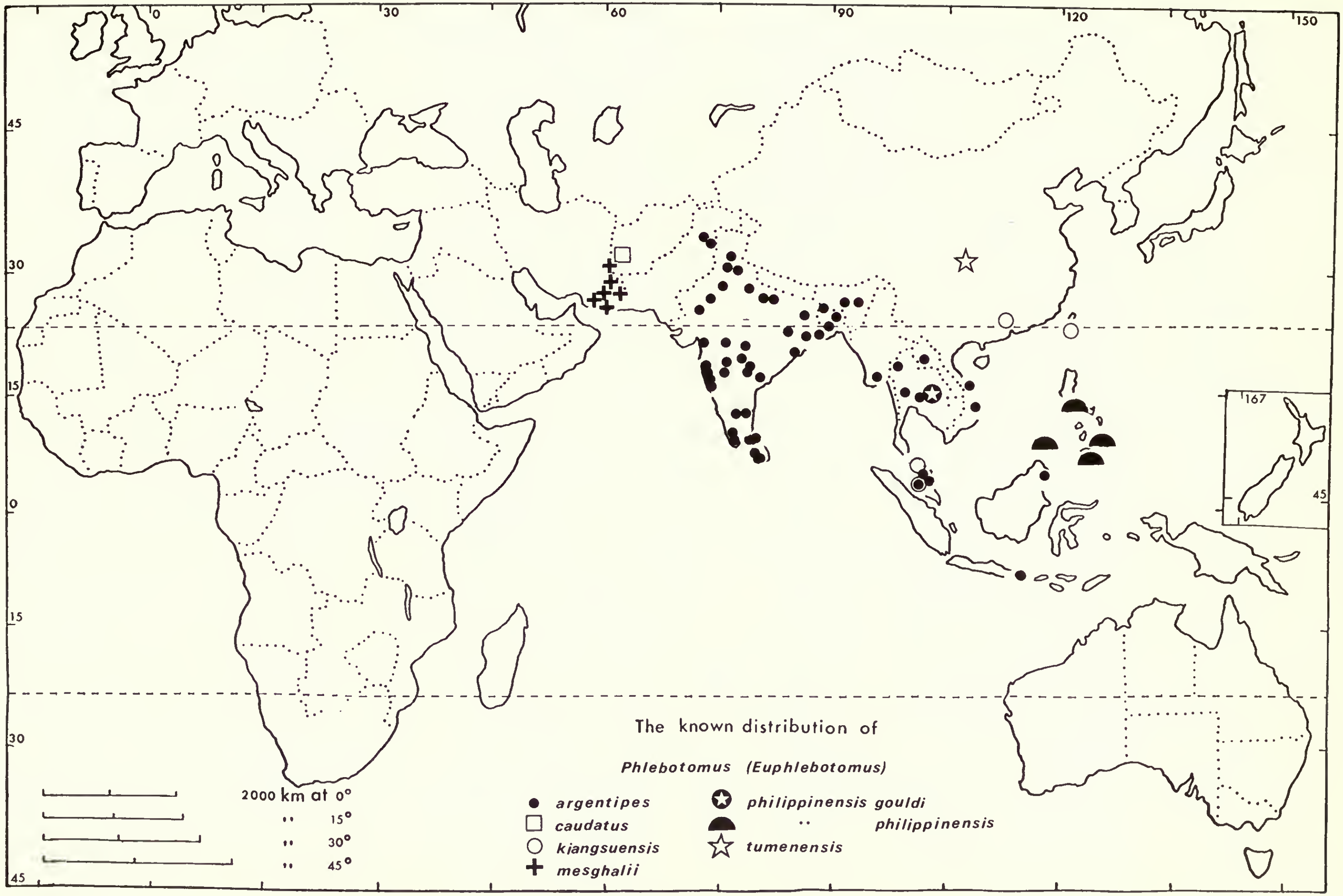
Map 9


The known distribution of
Phlebotomus (Adlerius)
▼ *angustus*
◆ *arabicus*
■ *balcanicus*
▲ *brevis*
● *chinensis*
✪ *comatus*
□ *davidi*
△ *halepensis*
✚ *hindustanicus*
○ *kabulensis*
2000 km at 0°
" " 15°
" " 30°
" " 45°
0
30
60
90
120
150
45
30
15
0
15
30
45
167
45
?

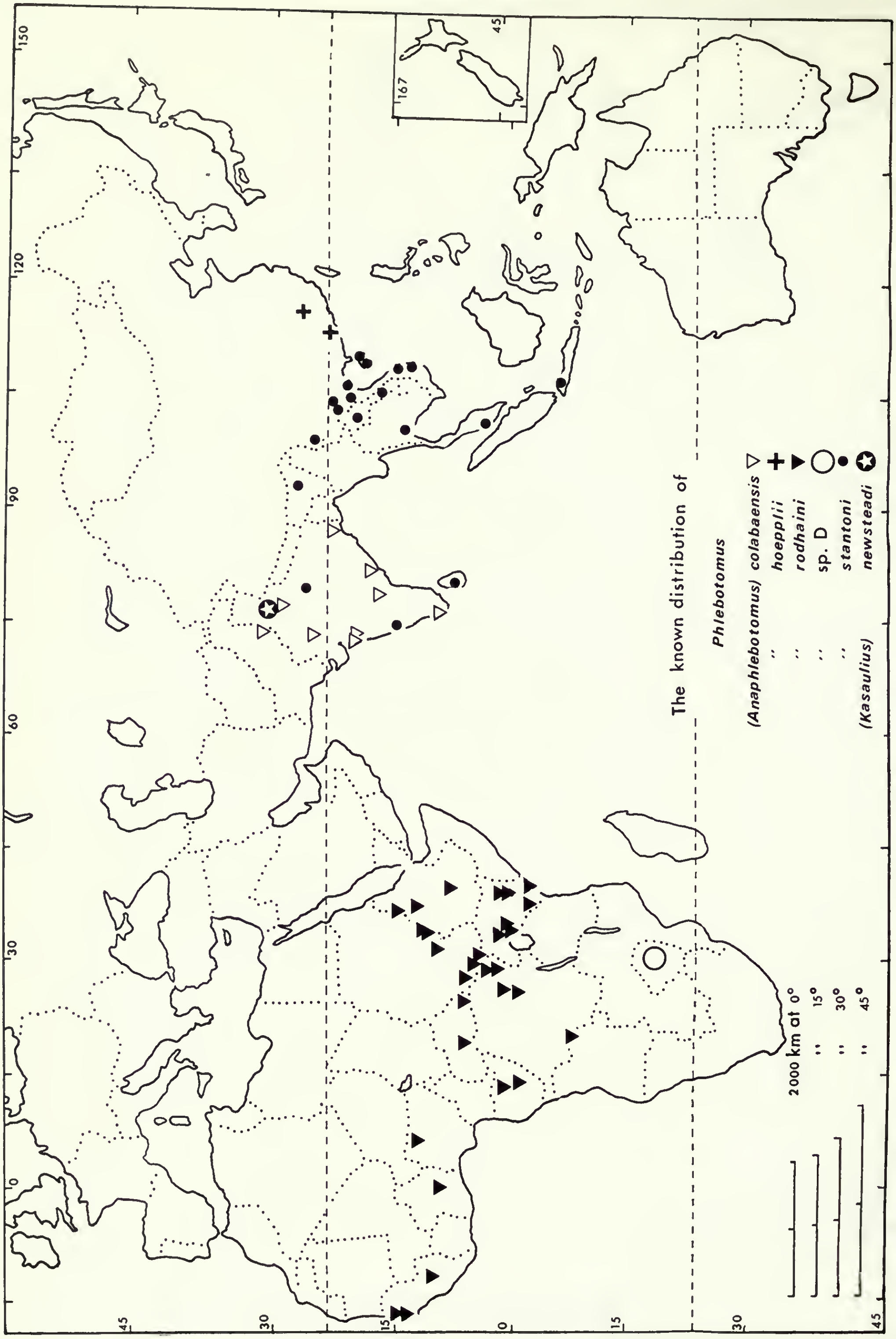
Map 10


The known distribution of
Phlebotomus (Adlerius)
▽ kyreniae
▶ longiductus
○ rupester
+ salangensis
● simici
★ turanicus
✪ zulfagarensis
2000 km at 0°
" " 15°
" " 30°
" " 45°
150
120
90
60
30
0
45
30
15
0
15
30
45
167
45

Map 11


The known distribution of
Phlebotomus (Euphlebotomus)
● *argentipes*
□ *caudatus*
○ *kiangsuensis*
✚ *mesghalii*
✪ *philippinensis gouldi*
◗ ,, *philippinensis*
☆ *tumenensis*
2000 km at 0°
,, 15°
,, 30°
,, 45°
0
30
60
90
120
150
167
45
30
15
0
15
30
45

Map 12


The known distribution of
Phlebotomus
(*Anaphlebotomus*) *colabaensis* ▽
" *hoepplii* ✚
" *rodhaini* ▶
" sp. D ○
" *stantoni* ●
(*Kasaulius*) *newsteadi* ✪
2000 km at 0°
" " 15°
" " 30°
" " 45°
150
120
90
60
30
0
45
30
15
0
15
30
45
167
45

Map 13

and New World CL at the present day. Mammalian leishmaniae may have developed separately in the Old and New Worlds during this period. Leishmaniae may have been absent from Australia some 120 MYA when, with Antarctica, it separated from the rest of the Old World.

In the Old World reptile leishmaniae presumably continued to exist and, with the appearance of the genus *Phlebotomus*, mammalian leishmaniae may have developed and become widespread, with no special relation to Central Asia (Bray, 1974: 95).

20 MYA to the present day

The increase, postulated above, of the subgenera *Phlebotomus*, *Paraphlebotomus*, *Larroussius* and *Adlerius* in the north of the Old World may have aided the development of mammalian leishmaniae, and thus account for the fact that much of the Old World human leishmaniasis is in northern latitudes, where at least some forms of VL and CL are thought to have arisen. The VL of Kenya and eastern India may have been secondary developments (Garnham, 1977). The vector in India, the only habitual man-biter in the widespread group of subgenera, is the western form of *P. argentipes*, which has adopted peridomestic habits (centred on cattle) in an area of dense human population and consequent destruction of many natural resting sites and wild animals.

Man had become numerous in the Old World about one MYA, long before his arrival in the New World, and in due course a few sandfly species became more or less domestic and therefore more effective vectors of leishmaniae.

The above hypotheses on sandfly and leishmanial evolution, based on circumstantial evidence and conjecture, and postulating an early split between Old and New World sandflies, and a late expansion of *Phlebotomus* in the north of the Old World, offer an explanation of some features of present-day distribution of leishmaniae.

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Stenomine moths of the Neotropical genus *Timocratica* (Oecophoridae)

Vitor O. Becker

Centro de Pesquisa Agropecuária dos Cerrados, Caixa postal, 70–0023, 73300-Planaltina, DF, Brazil

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Synopsis

The genus *Timocratica* Meyrick is revised and a key to the 46 species is provided together with distribution maps, illustrations of the male and female genitalia, and cladistic and phenetic analyses. Biological data and descriptions of the larvae and pupae are given for *T. palpalis* (Zeller) and *T. melanocosta* sp. n. Seventeen new species and one new subspecies are described, and 11 specific synonyms are newly established. Five species previously included in *Timocratica* are provisionally transferred to *Stenoma* Zeller; *S. butyrota* Meyrick (as comb. n.) and *Lychnocrates leucocapna* Meyrick (as comb. rev.) are transferred to *Timocratica*. The genus is restricted to the Neotropical Region and ranges from the gulf area of Mexico to northern Argentina. The species occur mainly in three Life Zones: Tropical Moist Forest, Tropical Premontane Moist Forest, and Tropical Premontane Wet Forest. The larvae of *palpalis* and *melanocosta* are injurious to various species of trees and bore into the trunks, feeding on the bark surrounding the entrance holes.

Nomenclatural summary

TIMOCRATICA Meyrick, 1912	
Lychnocrates Meyrick, 1926	
***albella*-group**	
albella (Zeller, 1839)	Surinam
***albitogata* sp. n.**	Brazil
amseli Duckworth, 1962 **sp. rev.**	Venezuela
albella Amsel, 1956 (nom. preocc.)	

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anelaea (Meyrick, 1932)	Brazil
argonais (Meyrick, 1932)	Brazil, Guyana, French Guiana
argonias Clarke, 1955 (misspelling)	
***bicornuta* sp. n.**	Brazil
butyrota (Meyrick, 1929) **comb. n.**	Colombia, Costa Rica, Panama, Peru
syndicastis (Meyrick, 1929) **syn. n.**	
***constrictivalva* sp. n.**	Ecuador
***fuscipalpalis* sp. n.**	Venezuela
grandis (Perty, [1833])	Brazil, French Guiana, Panama
***guarani* sp. n.**	Argentina, Paraguay
isarga (Meyrick, 1925)	Bolivia
leucorectis (Meyrick, 1925)	Bolivia, Brazil, French Guiana, Colombia, Peru
macroleuca (Meyrick, 1932)	Bolivia
maturescens (Meyrick, 1925)	Colombia, French Guiana, Venezuela
megaleuca (Meyrick, 1912)	Colombia
***melanocosta* sp. n.**	Brazil
***melanostriga* sp. n.**	Brazil
***nivea* sp. n.**	Brazil
palpalis (Zeller, 1877)	Argentina, Bolivia, Brazil
auxoleuca (Meyrick, 1925)	
haywardi Busck, 1939 **syn. n.**	
***parvifusca* sp. n.**	Costa Rica
***parvileuca* sp. n.**	Brazil
philomela (Meyrick, 1925)	Peru
***spinignatha* sp. n.**	Peru
subovalis (Meyrick, 1932)	Brazil
stomatocosma (Meyrick, 1932) **syn. n.**	
***titanoleuca* sp. n.**	Peru
***venifurcata* sp. n.**	Brazil
xanthosoma xanthosoma (Dognin, 1913)	French Guiana
sacra (Meyrick, 1918)	
***xanthosoma leucocephala* subsp. n.**	Colombia, Panama
***xanthotarsa* sp. n.**	Panama
species 3	Peru
species 4	French Guiana
species 5	Brazil
species 6	Brazil
species 7	Colombia
leucocapna-group	
effluxa (Meyrick, 1930)	Bolivia
leucocapna (Meyrick, 1926) **comb. rev.**	Colombia, Costa Rica, Peru, Venezuela
species 2	Peru
monotonia-group	
***agramma* sp. n.**	Brazil
fraternella (Busck, 1910)	Costa Rica
***longicilia* sp. n.**	Colombia
loxotoma (Busck, 1909)	Costa Rica, Guatemala, Mexico
major (Busck, 1911)	Brazil, Peru
***meridionalis* sp. n.**	Brazil, Paraguay, Bolivia
monotonia (Strand, 1911)	Brazil, Guyana, Colombia, Ecuador
isographa Meyrick, 1912 **syn. n.**	
claudescens Meyrick, 1925 **syn. n.**	
crassa Meyrick, 1925 **syn. n.**	
pompeiana Meyrick, 1925	Peru
species 1	Costa Rica

Introduction

The genus *Timocratica* includes the largest known species of Oecophoridae in the world. The females of some species, such as *leucorectis*, have a fore wing length of up to 32 mm, equivalent to about 80 mm wing-span. According to the male and female genitalia, it is a very homogeneous group, but externally the species show great variation, mainly in shape, venation and colour-pattern of the fore wings.

Timocratica is confined to the Neotropical Region, ranging from the Gulf of Mexico in the north, to the northern part of Argentina in the south. In South America it is almost restricted to the eastern side of the Andes, with most of the species represented in the Amazonian Basin.

Despite its wide geographical distribution, the genus is confined ecologically to a few Life Zones, chiefly to three: Tropical Moist Forest, Tropical Premontane Moist Forest, and Tropical Premontane Wet Forest (Fig. 1).

During the last 10 years I have reared bark-feeding larvae from several different host-plants in a number of localities, and found the white 'bark-feeder' *Timocratica albella* sensu auctorum to be a species complex. The vexed question of whether these white species and those described in *Lychnocrates* were related to the fuscous species of *Timocratica*, as suggested by Busck, was still unresolved. It was clear that a detailed revision of these groups was needed to solve this question and to provide accurate descriptions and definitions of the bark-feeding species.

The species with dull fuscous fore wings belonging to the *monotonia*- and *leucocapna*-groups are presumably cryptic, while the white species of the *albella*-group are considered to be mimetic. Possible models are the white species of the arctiid genus *Agylla* Walker, which are very abundant and are sympatric with those of *Timocratica*. This hypothesis is supported by field tests in which species of *Agylla* were rejected by birds. As *Timocratica* species are presumably not distasteful to predators, they may form a Batesian mimetic group of *Agylla*.

Nomenclatural history

The genus *Timocratica* was proposed by Meyrick (1912) to accommodate his fuscous species *isographa*; *tristrigata* Zeller and *major* Busck were included provisionally and later Meyrick (1925) added three new species to the genus. In 1926 he described *Lychnocrates* for another fuscous species, *leucocapna*, and added *effluxa* in 1930.

Although Meyrick described most of the white *Timocratica* species, he never considered them to be congeneric with *isographa* since, according to him, they had veins 2 and 3 (CuA_1 and CuA_2) of the fore wings free, not stalked as is usual in the fuscous species. As pointed out by Busck (1938: 283), the venation of the fore wings in this group (*Timocratica* sensu Busck, i.e. *Timocratica* + *Lychnocrates* + the white species) is highly variable, particularly in the white species; it varies not only between but also within species. Some of the white species also have CuA_1 and CuA_2 of the fore wings stalked as in *isographa* and related fuscous species.

Busck (1935) was the first to unite into one genus the fuscous species included here in the *monotonia*-group, the white species and the fuscous *Lychnocrates* species, his decision having been based on the similarity of the male and female genitalia. Clarke (1955) removed *Lychnocrates* from synonymy with *Timocratica*, on account of the free CuA_1 and CuA_2 of the fore wings, but retained *effluxa* (described by Meyrick in *Lychnocrates* and undoubtedly congeneric with *leucocapna*) in *Timocratica*.

Although colour-pattern and wing venation can be used to define three clearly distinct subgroups, these features are not sufficient to treat them as separate genera. In the Stenominae wing venation seems to have little taxonomic value, and the structure of the male genitalia is the main basis for generic division. As the genitalia of all the species discussed above are so similar, there is little doubt that they constitute a monophyletic group and they are here regarded as a single genus.

Material and methods

About 500 adult specimens of *Timocratica* were examined, representing 46 species. Of these about 250 are from my collection, 200 are from the BMNH collection, and 50 are from the

NMNH and other institutions indicated in the text. Although my collection contained half of the specimens, these represented only one-third of the species, six of them new. In the BMNH collection four-fifths of the species were represented, including 17 primary types of previously known species and seven of the new species described here. I reared about 100 specimens of two species, *palpalis* and *melanocosta*, and eight larvae and four pupae of these have been studied.

Of the specimens studied, about 300 belonged to only four species: *argonais, butyrota, melanocosta* and *palpalis*. In contrast, 15 species were represented only by single specimens; nine of these by females, including five of the seven described but unnamed species.

The classification and descriptions of the *Timocratica* species were based on characters of dry adult specimens. Thirty-four characters were selected, as discussed in the section on classification, and used in the cladistic analysis. A selection of these characters was used again in the phenetic analysis as two-state characters.

In the cluster analysis three methods were used to assess the overall similarity or dissimilarity of all species: (*a*) the product-moment correlation coefficient; (*b*) the taxonomic distance coefficient (Sneath & Sokal, 1973: 124); (*c*) Gower's coefficient (Gower, 1971). The data were used either in their untransformed state or after standardization by characters to zero means and unit standard deviations. Clustering of the taxa from the between-taxon similarity/dissimilarity matrix was accomplished by the weighted pair-group method of Sokal & Sneath (1963). All these computations were carried out by a program of Davis (1973), as amended and extended by Dr R. G. Davies (unpublished). The program also constructed and drew on the line-printer, the dendrogram expressing the results of the cluster analysis.

The measurements at the beginning of each description are those of the fore wing length of the smallest and largest specimen, measured in millimetres from the base to the apex of the wing. In several instances the number of available specimens was limited and variation in size of those species may be greater than is indicated by the recorded measurements.

Dissections and slide preparations followed the method described by Robinson (1976). The number of genitalia preparations varied with the relative similarity of species and material available, and is detailed for each species under 'Material examined'. Head preparations were made and illustrated only for representative species of each of the three species-groups. The wing venation is illustrated for representatives of each species-group and for species which differ from the pattern in the group. Drawings of the genitalia are based on individual specimens and are not composite. The size of the illustrations depended on the size of the specimens. Large specimens were drawn to a smaller scale and in some instances figures of different scale appear on the same page. The photographs of the moths show the right-hand wings; where these were unsuitable for photography the left-hand wings were taken and the image reversed. All the drawings and half-tone illustrations except one were made by myself.

The geographical distribution of each species is based on specimen labels, completed and/or corrected, when necessary, according to the 1968 edition of the *Times Atlas of the World*. Localities not traced in this atlas were corrected and completed following Brown (1979). Altitude, when given in feet on the specimen label, was converted into metres, for example: "1000 m ('3100 ft')".

The ecological distribution of the species of *Timocratica* is expressed according to Holdridge's system of 'Classification of World Life Zones' (Holdridge, 1967; 1978; Holdridge *et al*., 1971). This system has the advantages of being simple and easily used by any biologist, not only by ecologists, and of being objective, since it is based mainly upon meteorological data, *viz*., annual average temperature and total annual precipitation. Another advantage is that most of the Central and South American countries have already been mapped following this system.

Data on temperature and precipitation were taken from Wernsted (1972). However, as there are no meteorological stations at the localities of many of the species, the data used were those provided by the nearest station at the same altitude. In a few cases, no nearby meteorological station at a similar altitude was found in Wernsted, and the nearest station was selected and the temperature corrected assuming a decrease of about 6°C per 1000 m of elevation (Holdridge, 1971: 13). Following these procedures a list of all the localities taken from specimen-labels was organized, including geographic coordinates, altitude, mean annual temperature, total annual

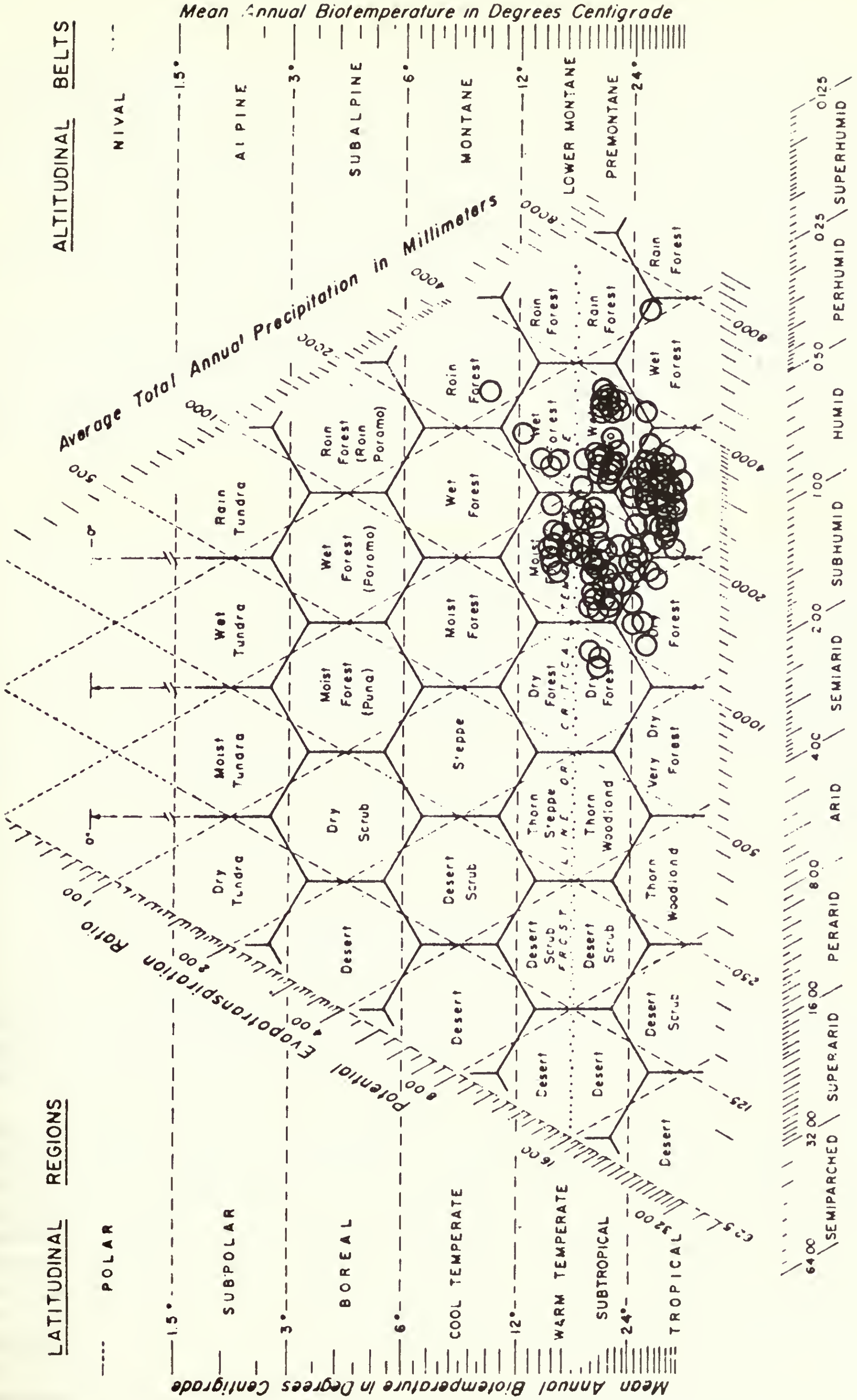


Fig. 1 Diagram of Holdridge's classification of World Life Zones, with the ecological distribution of *Timocratica*.

precipitation and the respective Life Zone. This list was submitted to Dr Holdridge who checked it and made corrections and comments.

It must be remembered that label data are sometimes vague or wrong, particularly on specimens from old collections. Therefore, especially in mountainous areas where the climate changes over relatively short distances, many specimens could have been collected in Life Zones different from those calculated from the available label data. Another problem resulting from lack of data and particularly of specimens is that some specimens were probably collected in associations atypical of the Life Zone ('Climatic Association' of Holdridge, 1971: 16). A good example of non-climatic association and of specimens presumably mislabelled is that of *T. major*.

Despite the problems pointed out in the last paragraph, Holdridge's Life Zone system provides valuable information about the ecological adaptations of the species and also gives a good indication of where a species could be expected to occur.

The host-plants collected by the author were identified by Dra M. Brandão Ferreira, Empressa de Pesquisa Agropecuária de Minas Gerais, Belo Horizonte, and are marked in the Table with an asterisk (*). Other hosts are quoted from Araujo *et al.* (1968: 290) and from Hayward (1969: 72). Brazilian vernacular names for the Myrtaceae are taken from Legrand & Klein (1967–1978). English vernacular names are quoted from Bailey (1900–1902) and Adams (1972). The ichneumonid parasite of *palpalis* was identified by Dr M. G. Fitton, BMNH.

Abbreviations of depositories

BMNH	British Museum (Natural History), London, England
ESALQ	Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba, São Paulo, Brazil
IP	Institut für Pflanzenschutzforschung, Eberswalde, East Germany
LN	Landessammlungen für Naturkunde, Karlsruhe, West Germany
MNHU	Museum für Naturkunde der Humboldt-Universität, Berlin, East Germany
MN	Museu Nacional, Rio de Janeiro, Brazil
NM	Naturhistorisches Museum, Vienna, Austria
NMNH	National Museum of Natural History, Smithsonian Institution, Washington, D.C., U.S.A.
UCV	Universidad Central de Venezuela, Maracay, Venezuela
VB	V. O. Becker collection, Centro de Pesquisa Agropecuária dos Cerrados, Planaltina, Brazil
ZSBS	Zoologische Sammlung des Bayerischen Staates, Munich, West Germany

Colour-pattern and defence

Species of *Timocratica* show two basic colour-patterns. Those belonging to the *monotonia* and *leucocapna* species-groups, as well as *parvifusca*, which belongs to the *albella*-group, have dull fuscous fore wings and bright golden-ochreous hind wings and abdomen. The species of the *albella*-group, except for *parvifusca*, have white fore wings and white or golden-yellow hind wings and abdomen.

Concerning protection against predation, the first group is probably cryptic, or possibly cryptic only when at rest as the raised golden-ochreous hind wings are possibly aposematic. The second group, the whites, are probably mimetic. Adults of many species of arctiids are known to be toxic (Rothschild *et al.*, 1979), and field tests carried out by Collins & Watson (1981) in Venezuela showed that white species of lithosiids (Arctiidae) were rejected by birds. These mostly white lithosiids form a very large and common group, now included in the genus *Agylla*, and are sympatric with the species of *Timocratica*. If the species of *Timocratica* prove not to be toxic, they would form a Batesian mimetic group of the species of *Agylla*.

This complex of white mimics may also include other moths, such as species of *Rupela* Walker (Schoenobiinae), a large genus of Neotropical pyralids.

The cryptic group of *Timocratica* includes 12 species, the supposed mimic group 34 species. Thus, if other factors that might affect the success of a group of living organisms are excluded, it seems that a mimetic habitus provides more effective protection than crypsis in *Timocratica*.

Geographical and ecological distribution

The *monotonia*-group, despite its relatively small number of species, has the widest geographical and ecological distribution. It ranges from Mexico and Central America, where it is represented by two species, possibly three, to the Warm Temperate Moist Forest in the southern part of Brazil, where it is represented by *meridionalis*; one species, *longicilia*, occurs in the Tropical Montane Rain Forest in the mountains of Colombia.

The *leucocapna*-group appears to be a montane group as it has been collected only in the mountains of Peru, Colombia and Costa Rica, being restricted to the Tropical Premontane Moist Forest and the Tropical Premontane Wet Forest Life Zones.

The *albella*-group, the largest of the species-groups, is mainly South American and only two species, *xanthotarsa* and *parvifusca*, are known to occur in Central America (Panama and Costa Rica). Ecologically the group is almost confined to the Tropical Moist Forest and the Tropical Premontane Moist Forest and Wet Forest, but it is represented by three species in the Warm Temperate and Subtropical Moist Forest, and by one, *guarani*, in the Warm Temperate Dry Forest.

Classification of *Timocratica*

Like many other lepidopterous groups of the Neotropical Region, particularly Microlepidoptera, the Stenominae have been very little studied or even collected. Therefore it is very difficult to appreciate the degree of variation in the group, or the relationship between the different groups in the subfamily.

An attempt was made to work out the phyletic relationship of the species based on a cladistic analysis of the genus. However, as discussed below, many difficulties were found and only a basic division of the genus into three species-groups, as arranged in the cladogram (Fig. 2), seems to be sound; because of this, the species of each of the three species-groups are arranged phenetically, following numerical methods.

Cladistic analysis

Although the species now included in the genus *Timocratica* show great external differences between species-groups, mainly in colour-pattern, they apparently constitute a monophyletic group. According to the characters discussed below, the genus is composed of three species-groups, each of them also apparently monophyletic.

This basic division of the genus into three species-groups seems consistent and presumably reflects very well the first steps of its evolution. However, above this level it was impossible to understand the relationship between the species within each of the three groups. The main difficulty is lack of data. Obviously many of the apomorphies are not expressed morphologically, but reflected in behaviour, host-preferences, ecological adaptations, and other biological and physiological features. As the biology of *Timocratica* is insufficiently known, none of this information can be included in the analysis. Another difficulty is related to the method itself, as conceived by Hennig (1966). It seems that cladistic analysis may work very well at generic level and for higher classification, but not at specific level, except perhaps with relatively small and well-known groups. At the specific level it is often very difficult to decide whether a particular state of a character is primitive (plesiomorphic) or derived (apomorphic).

Although most of the important genera of the subfamily are still poorly known, it seems very likely that the sister-group of *Timocratica* is the genus *Loxotoma* Zeller, which includes only two described species. They have similarly broad valvae, with sacculus and ampulla not differentiated, and a strong uncus that is basally broad and bent ventrad. *Loxotoma* also constitutes a monophyletic group, whose species share at least the apomorphic state of character 1. The monophyly of *Timocratica* is defined by characters 2–4 (Fig. 3). In the following list the headings denote the apomorphic state.

(1) Basal third of fore wing costa concave

In most Stenominae, including *Timocratica*, the fore wing costa is straight to convex. In *Loxotoma* the costa is concave, as are the subcostal and first radial veins to some extent (see figure in Duckworth, 1967: 7).

(2) Gnathos undivided medially

Timocratica has an undivided gnathos expanded medially to form a strongly sclerotized projection which is bent ventrad, the 'apex'. In *Loxotoma* as well as in other presumably related groups, such as *Falculina* Zeller, the gnathos is divided in the middle, often forming a pair of apically dentate arms.

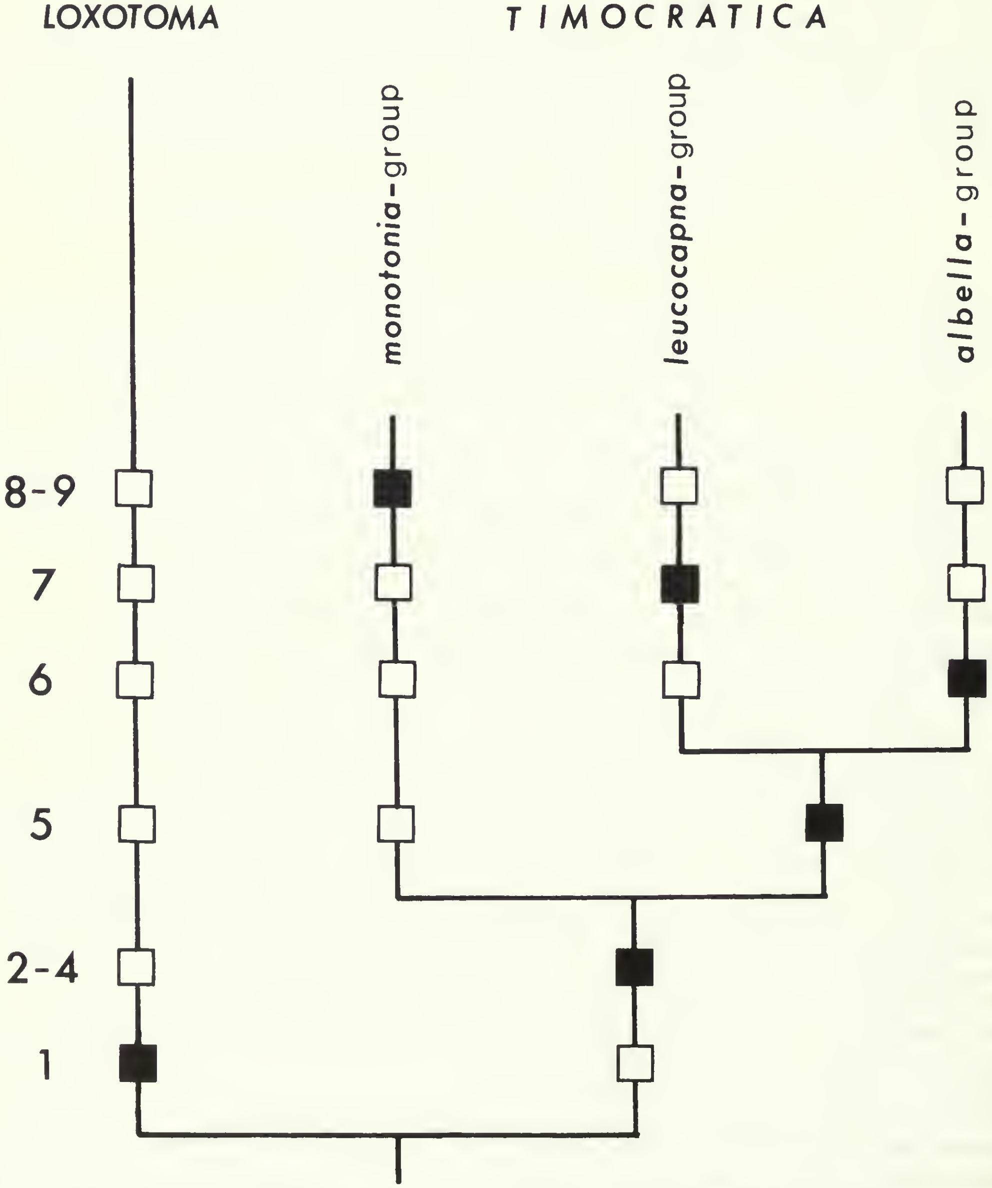
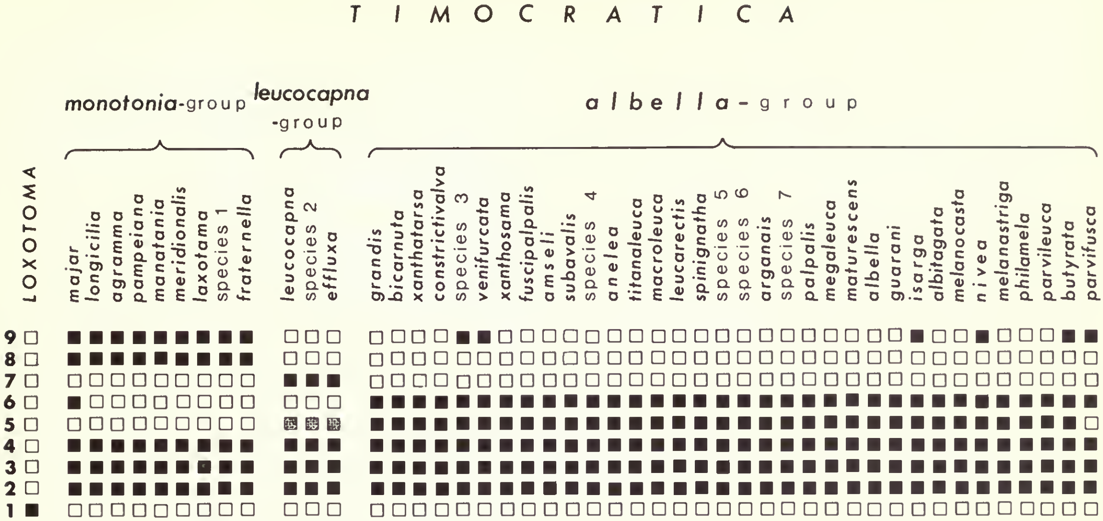


Fig. 2 Cladogram representing the relationship between *Timocratica* and *Loxotoma*, and the primary division of *Timocratica* into species-groups. Open squares denote plesiomorphy, filled represent apomorphy. Numbers refer to characters discussed in the text.


TIMOCRATICA
monotonia-group
leucocapna -group
albella-group
LOXOTOMA

	LOXOTOMA	*monotonia*-group									*leucocapna*-group			*albella*-group																																	
		majar	*longicilia*	*agramma*	*pampeiana*	*manatania*	*meridionalis*	*laxotama*	species 1	*fraternella*	*leucocapna*	species 2	*effluxa*	*grandis*	*bicarnuta*	*xanthatarsa*	*constrictivalva*	species 3	*venifurcata*	*xanthosama*	*fuscipalpalis*	*amseli*	*subavalis*	species 4	*anelea*	*titanaleuca*	*macroleuca*	*leucarectis*	*spinignatha*	species 5	species 6	*arganais*	species 7	*palpalis*	*megaleuca*	*maturescens*	*albella*	*guarani*	*isarga*	*albitagata*	*melanocasta*	*nivea*	*melanastriga*	*philamela*	*parvileuca*	*butyrata*	*parvifusca*
9	□	■	■	■	■	■	■	■	■	■	□	□	□	□	□	□	□	■	■	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	■	□	□	■	□	□	□	■	■
8	□	■	■	■	■	■	■	■	■	■	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
7	□	□	□	□	□	□	□	□	□	□	■	■	■	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
6	□	■	□	□	□	□	□	□	□	□	□	□	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
5	□	□	□	□	□	□	□	□	□	□	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	□
4	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
1	■	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□

Fig. 3 Character matrix of the genus *Loxotoma* and the species of *Timocratica.* Open squares denote plesiomorphy, filled squares apomorphy, shaded squares the intermediate state of an apomorphic transformation series. Numbers refer to characters discussed in the text.

(3) Juxta with two simple, almost straight, lateral processes

In *Timocratica* the two lateral processes of the juxta are simple and almost straight, whereas in *Loxotoma* each process is divided in two as in *Falculina* where these processes are developed into very complex structures.

(4) Vesica armed with cornuti

In *Timocratica* the vesica is armed with a strong cornutus or covered with many spines, or with both. These features are not developed in *Loxotoma* or other related genera such as *Falculina.*

(5) Fore wings with white scales

The species of the *monotonia*-group have the ground-colour of the fore wings plain fuscous, a state which is also found in the related genus *Loxotoma.* The species of the *albella*-group have a plain white ground-colour, and in the *leucocapna*-group the ground-colour is fuscous but with areas of white scales on the upper surface of the fore wing, mainly beyond the cell. The presence of such white scales in the *leucocapna*-group and the white fore wings in the *albella*-group could therefore be considered an apomorphic transformation series. This makes these two species-groups the sister-clade of the *monotonia*-group.

(6) Digitate processes of juxta long

The *monotonia*- and *leucocapna*-groups have the digitate processes of the juxta short, not reaching the anterior side of the gnathos (except in *major* where they are long, as in the *albella*-group). In the *albella*-group these processes are often very long, overlapping the anterior side of the gnathos. Short processes are here considered plesiomorphic, as the homologous hairy processes in the related genera *Loxotoma* and *Falculina* are also short.

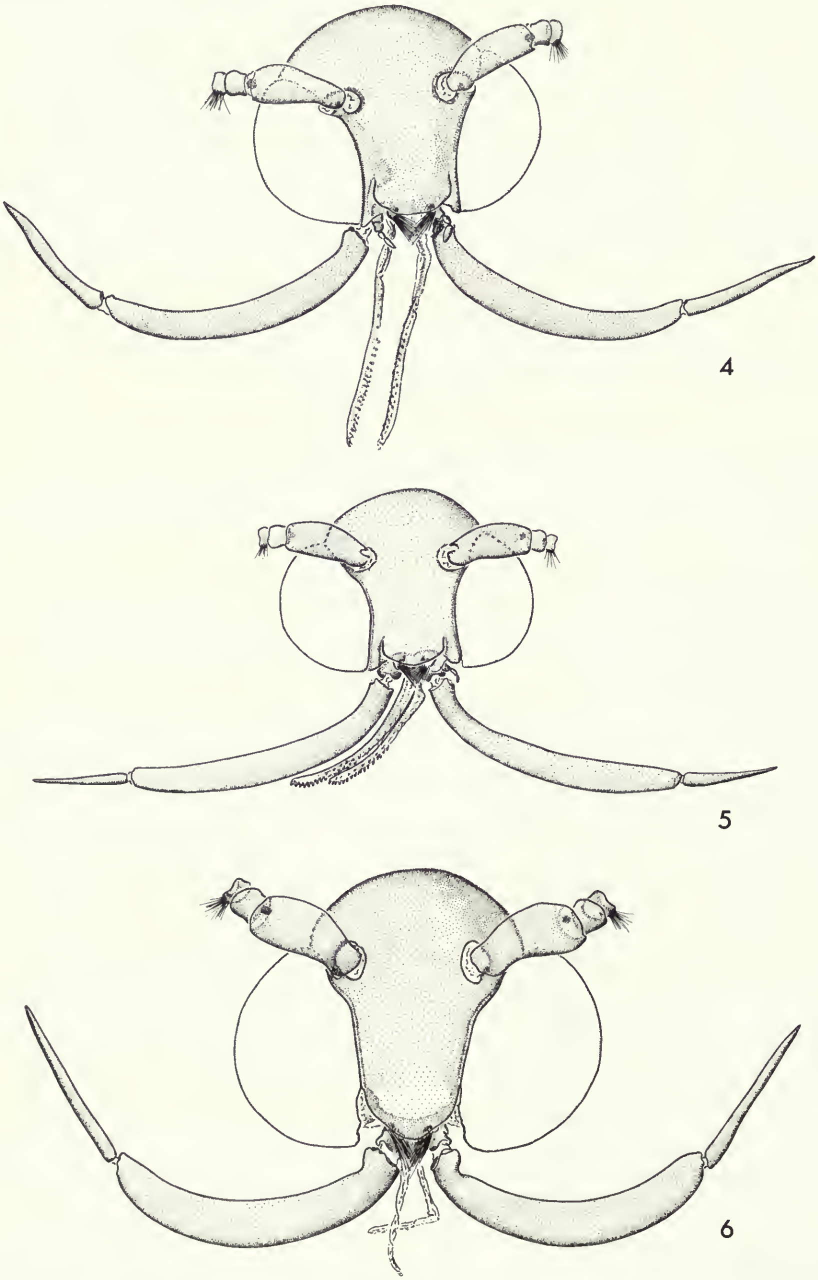
(7) Third segment of labial palpus small

In the *leucocapna*-group the third segment of the labial palpus is much reduced (Figs 5, 8), less than one-third the length of the second; in the other species-groups, as well as in *Loxotoma,* it is longer, about two-thirds the length of the second (Figs 4, 6, 7, 9).

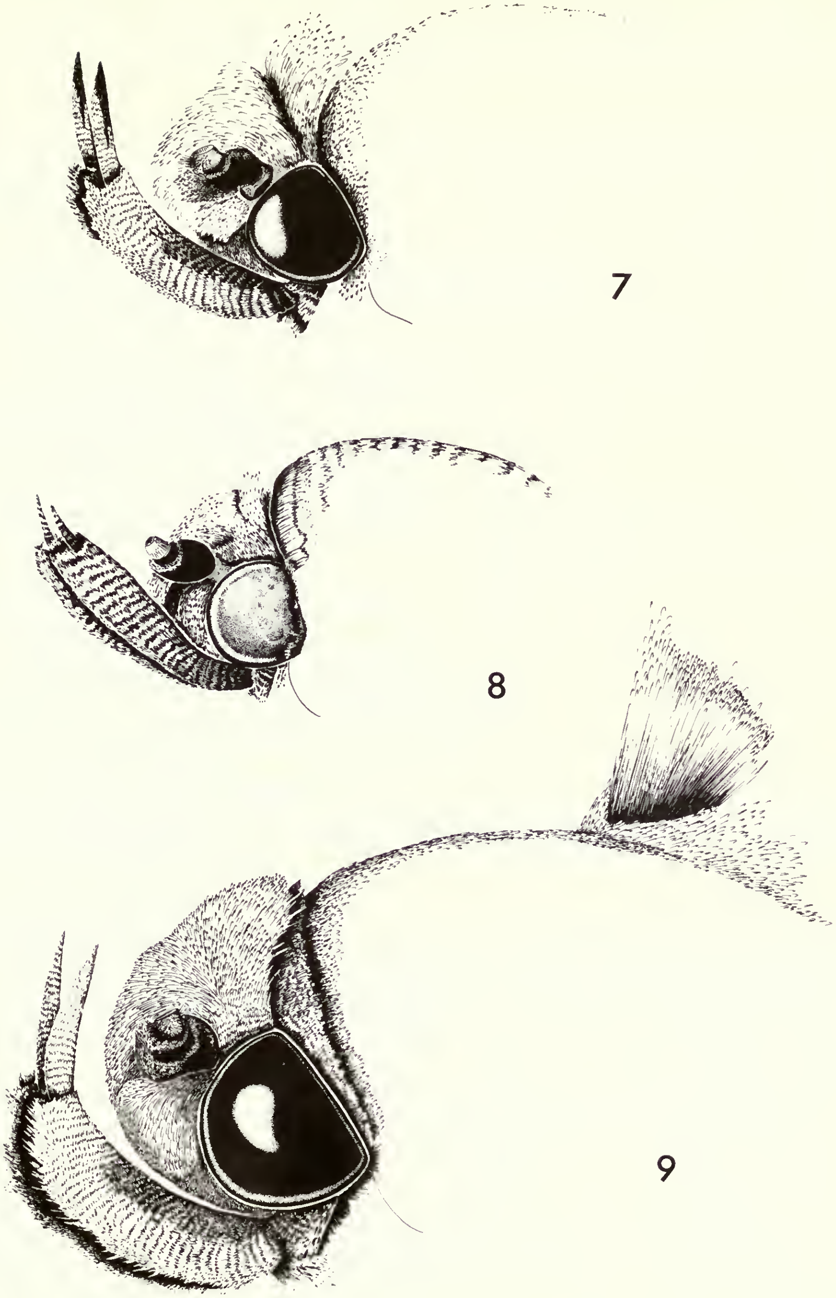
(8) Mesonotum with long scales

In the *monotonia*-group the scales along the middle of the mesonotum are very long and raised to form a crest (Fig. 9); in the remaining groups these scales are normal as in *Loxotoma* and *Falculina.* Therefore, this development is an autapomorphic state for the *monotonia*-group.

(9) Fore wings with cubital veins stalked
The species of the *monotonia*-group have the fore wings with CuA_1 and CuA_2 stalked (Fig. 12); in the *leucocapna*-group all the veins are free (Fig. 13); and in the *albella*-group the veins are free in most species but in some the cubitals are stalked (Figs 13, 16, 24). However, the stalking in these few species seems to be linked to the stalking of veins R_4 and R_5, a character not found in the other two species-groups. Considering that *Loxotoma* also has all the veins free, the stalking of the cubital veins in the *monotonia*-group can be considered apomorphic.



Figs 4–6 *Timocratica* species, frontal view of denuded heads. 4, *T. palpalis* (Zeller). 5, *T. leucocapna* (Meyrick). 6, *T. monotonia* (Strand).



Figs 7–9 *Timocratica* species, lateral view of heads with dorsal outline of thorax. 7, *T. palpalis* (Zeller). 8, *T. leucocapna* (Meyrick). 9, *T. monotonia* (Strand).

Phenetic analysis

A satisfactory arrangement based on a cladistic analysis of the species-groups, mainly those within the *albella*-group, could not be produced. This failure was due mainly to the mosaic pattern of evolution shown by the species. An assessment of phenetic similarity was therefore made, following numerical methods, as shown in Figs 10, 11.

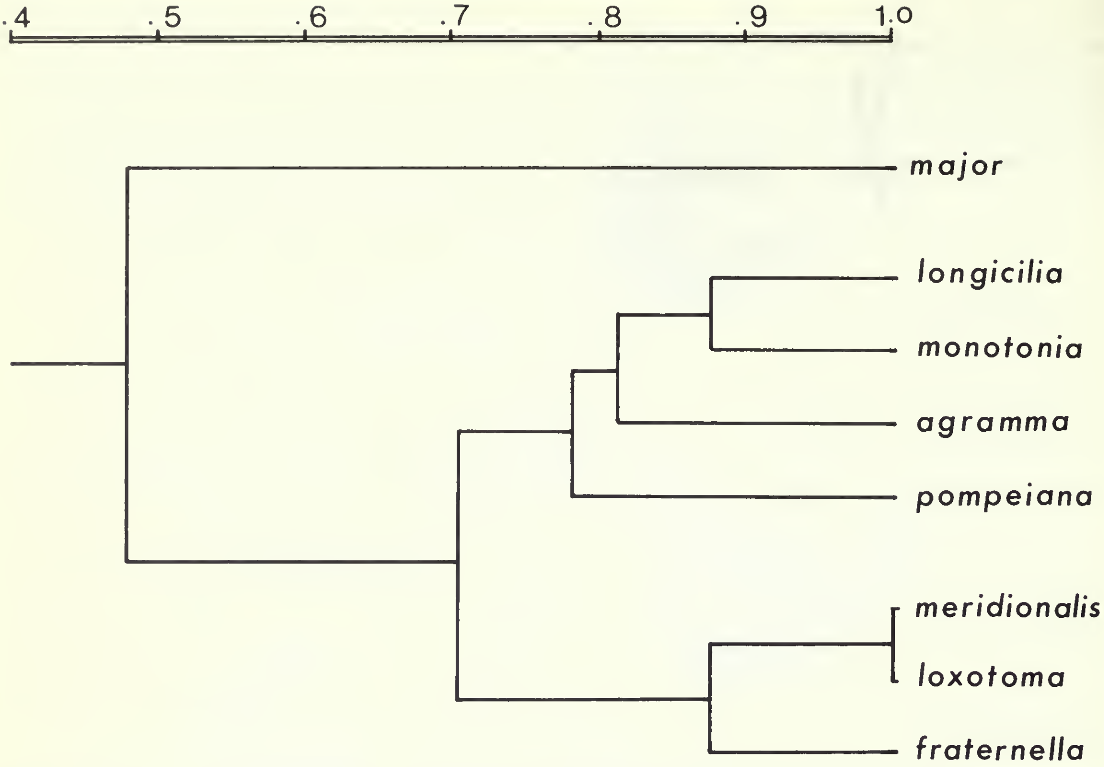


Fig. 10 Phenogram of the species of the *monotonia*-group of *Timocratica* calculated by weighted pair-group method of average linkage from matrix of between OTU Gower's coefficient. Numbers at top denote magnitude of correlation coefficient.

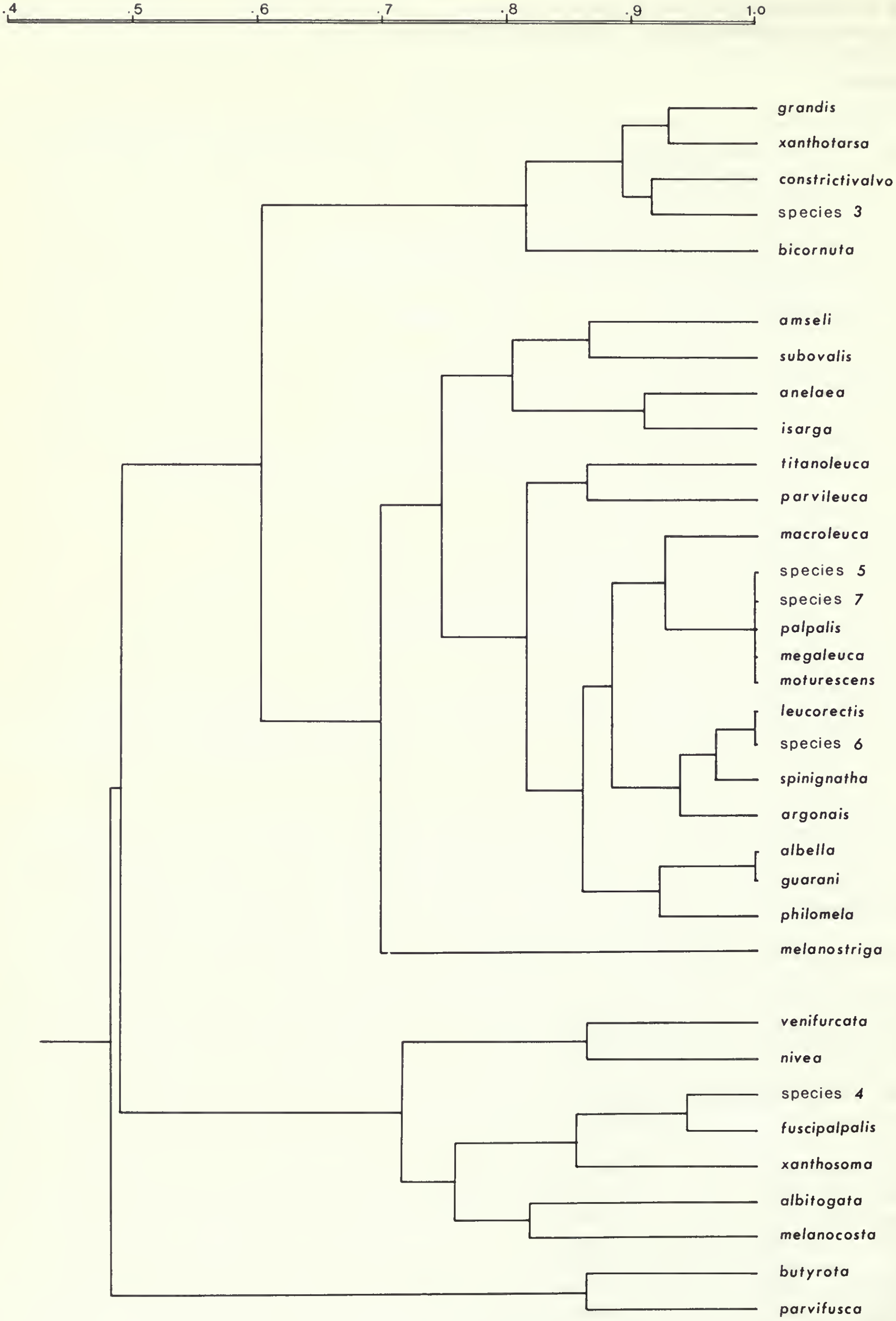
In addition to the nine characters used in the cladistic analysis a further twenty-five were selected and used in the phenetic analysis (Table 1).

The arrangements given by the three phenetic methods showed few differences from one another, and in a few cases they were even identical. However, the most generally satisfactory results were provided by Gower's Coefficient.

The clustering of the *monotonia*-group (Fig. 10) was based on characters 6 and 10 to 16. The basic division of this group into three subgroups, as shown in the phenogram, reflects very well what was expected from the overall similarity of the species. *T. major* is really a very distinctive species in the group, and its separation from the others seems plausible. The division of the other species into two groups, as shown in the same phenogram, also seems correct, although the arrangement of the species inside each of these subgroups does not reflect very well what might have been expected from their overall resemblance. As discussed in the taxonomic section, *monotonia* and *pompeiana* would have been expected to form a pair of very closely related species, or even to appear as forms of the same species. In the other subgroup, for the same reasons, *fraternella* and *loxotoma* should form a pair of closely related species, as indicated by the absence of coremata on the male abdomens and by their geographic distribution. The species *meridionalis* and *loxotoma* came together in the phenogram because the free coremata (character 12), as present in *meridionalis*, and the absence of coremata, as shown in *loxotoma* and *fraternella*, were both considered as apomorphic, while the presence of coremata bound into pockets, as shown by the other species of the group, is considered plesiomorphic. As *meridionalis* and *loxotoma* are almost identical in respect of the remaining characters, they were therefore clustered together, while *fraternella*, which shares the absence of coremata with *loxotoma*, was separated from both by the apomorphic fuscous hind wings.

Table 1 Characters used in the phenetic analysis as two-state variables. a = presumed apomorphies, p = presumed plesiomorphies, ? = assessment of apomorphy/plesiomorphy not established.

Character no.	Description
10	a. Fore wing with apex pointed
	p. Fore wing with apex rounded
11	a. Fore wing with fasciae linked posteriorly
	p. Fore wing with fasciae free
12	a. Coremata of second abdominal segment free or absent
	p. Coremata of second abdominal segment located in a pocket
13	a. Hind wing fuscous
	p. Hind wing golden-ochreous or golden-yellow
14	a. Apex of gnathos folded
	p. Apex of gnathos not folded
15	a. Fore wing with transverse fasciae absent
	p. Fore wing with transverse fasciae present
16	a. Valva with base broader than distal part
	p. Valva with dorsal and ventral margins almost parallel or narrowed basally
17	a. Hind wing bordered with fuscous
	p. Hind wing plain golden-yellow
18	a. Hind wing white or tinged with yellow
	p. Hind wing plain golden-yellow
19	a. Abdomen above white or tinged with yellow
	p. Abdomen above plain golden-ochreous
20	a. Fore wing underside with yellow colour absent
	p. Fore wing underside with yellow colour present
21	a. Hind tarsus white
	p. Hind tarsus golden-ochreous
22	a. Fore tarsus white
	p. Fore tarsus fuscous
23	a. Fore tarsus golden-ochreous
	p. Fore tarsus fuscous
24	a. Frons plain white
	p. Frons edged with fuscous
25	a. Labial palpus with ochreous colour absent
	p. Labial palpus with ochreous colour present
26	a. Labial palpus with fuscous colour absent
	p. Labial palpus with fuscous colour present
27	a. Gnathos with lateral arms modified
	p. Gnathos with lateral arms not modified
28	a. Vesica with small spines missing
	p. Vesica with small spines present
29	a. Fore wing with R_4 and R_5 stalked
	p. Fore wing with R_4 and R_5 free
30	a. Fore wing with base of costa tinged with grey
	p. Fore wing with base of costa white
31	a. Veins marked with dark fuscous
	p. Veins not marked with dark fuscous
32	a. Ductus bursae and corpus bursae not differentiated
	p. Ductus bursae and corpus bursae differentiated
33	?. Gnathos with pointed apex
	?. Gnathos with rounded apex
34	?. Margin of ostium bursae convex
	?. Margin of ostium bursae concave or straight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grandis
xanthotarsa
constrictivalvo
species 3
bicornuta
amseli
subovalis
anelaea
isarga
titanoleuca
parvileuca
macroleuca
species 5
species 7
palpalis
megaleuca
moturescens
leucorectis
species 6
spinignatha
argonais
albella
guarani
philomela
melanostriga
venifurcata
nivea
species 4
fuscipalpalis
xanthosoma
albitogata
melanocosta
butyrota
parvifusca

Fig. 11 Phenogram of the species of the *albella*-group of *Timocratica* calculated by weighted pair-group method of average linkage from matrix of between OTU Gower's coefficient. Numbers at top denote magnitude of correlation coefficient.

The arrangement of the species of the *albella*-group was based on the similarity of characters 5, 9 and 19–34. The resulting grouping (Fig. 11) also looks reasonable, except that the species with a golden-ochreous abdomen and white hind wings, related to *xanthosoma*, were mixed up with those related to *albella* which have a white abdomen and white hind wings. If this character (the colour of the abdomen in the *albella*-group) is considered as more important than most of the others analysed, then *amseli*, *subovalis*, *venifurcata*, *xanthosoma* and *fuscipalpalis* should form a group of closely related species. A few other species, viz., *anelaea* + *isarga* and *titanoleuca* + *parvileuca*, also seem to be wrongly associated. As discussed in the taxonomic section, *isarga* appears to be related to *palpalis*, and *parvileuca* to *butyrota*. These apparent inaccuracies in the phenetic cluster analysis probably resulted from the lack of representation of males or females in about two-thirds of the species, and from the equal weight given to all characters.

TIMOCRATICA Meyrick

Timocratica Meyrick, 1912; 706; Busck, 1935: 16 [catalogue]; Clarke, 1955: 384 [adult, genitalia]. Type-species: *Timocratica isographa* Meyrick, 1912 [=*Cryptolechia monotonia* Strand, 1911], by original designation and monotypy.

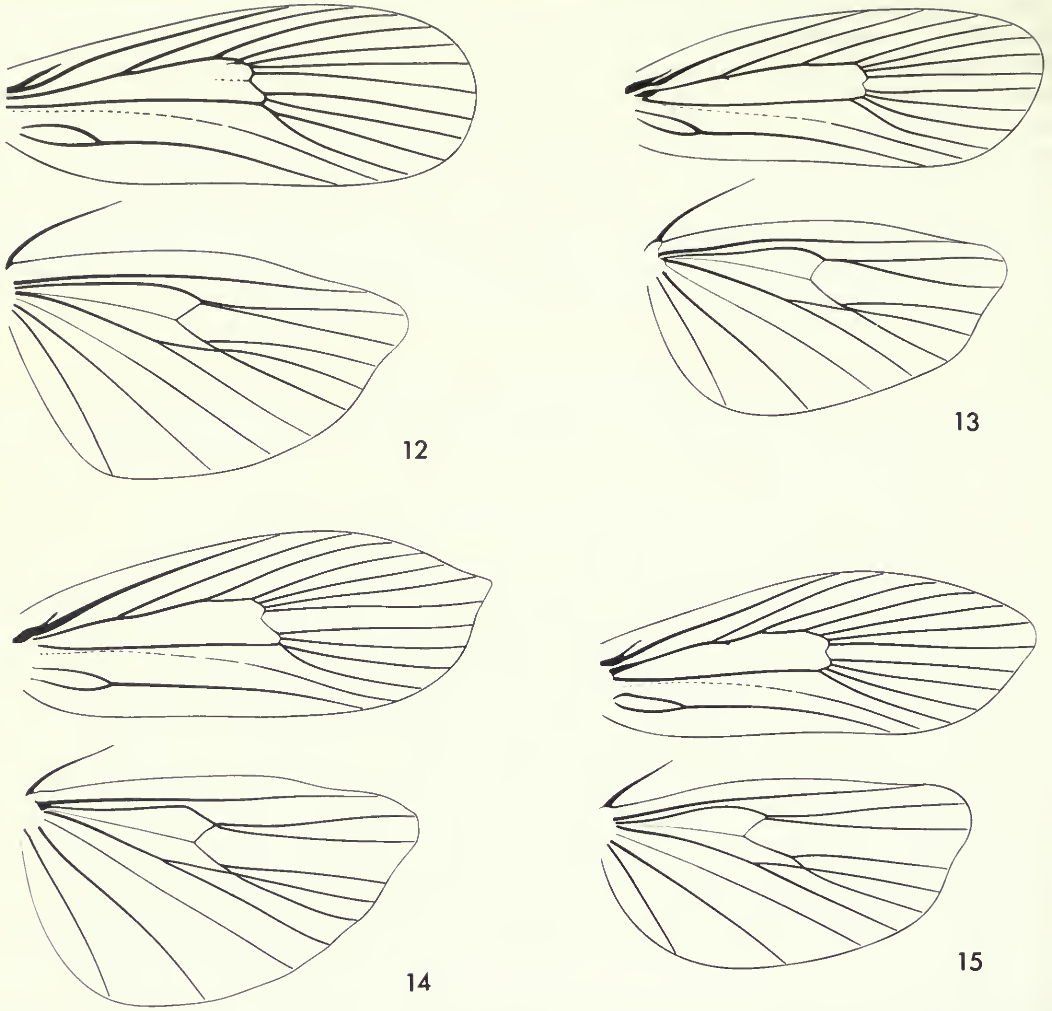
Lychnocrates Meyrick, 1926: 226; Clarke, 1955: 224 [adult, genitalia]. Type-species: *Lychnocrates leucocapna* Meyrick, 1926, by monotypy. [Synonymized by Busck, 1935: 16.]

Vertex densely covered with long, narrow scales. Haustellum slighly shorter than second segment of labial palpus, covered basally with long scales, distal half with sensory papillae. Maxillary palpus four-segmented, about length of first segment of labial palpus. Labial palpus ascending, reaching to vertex or beyond; first segment very short, one-quarter length of second; second segment about twice length eye diameter, slightly curved upwards, with long rough scales below; third segment one-third to same size as second, smooth-scaled, thick to slender, slightly curved upwards, or straight. Antenna three-quarters length of fore wing, ciliation one-half to twice diameter of flagellum. Thorax with or without dorsal crest, densely or sparsely covered with long hair-like scales below. Metascutum with pair of long, hair-like, posteriorly directed groups of scales. Fore tarsus thickened by long scales; hind tibia covered with long, rough, hair-like scales. Fore wing subrectangular to suboval; apex rounded, pointed in few species; fuscous, often with three oblique fasciae, or plain white; 12 veins (11 in holotype of *syndicastis* [= *butyrota*]), R_1 from middle of cell, R_2 closer to R_3 than to R_1, R_4 and R_5 very close, connate or stalked; CuA_1 and CuA_2 very close, connate or stalked (Figs 12–24). Hind wing sometimes golden-ochreous to plain white, rarely fuscous. Abdomen long, robust, weakly sclerotized, reaching tornus in resting position, densely covered with narrow scales; male often with pair of coremata on second sternite (Fig. 25); apodemes on second abdominal sternite short in female, modified in male to accommodate coremata; sternites two to seven with some small sparsely distributed setae; eight with several longer ones; first tergite as well as genitalia covered with long narrow scales; female with dorsal membrane between eighth and ninth segments expanded as a wide inwardly directed sac.

GENITALIA ♂. Symmetrical. Uncus very broad basally, nearly triangular or with lateral margins nearly parallel, long, strong, bent ventrad, naked. Gnathos often belt-like, modified medially into strong, sclerotized, often pointed process. Juxta a transverse plate with two long, usually symmetrical, posteriorly directed lobes covered distally with long setae. Vinculum complete, often rounded. Valva long, broad, lateral margins nearly parallel or constricted basally, inner surface of distal half covered with many modified, strong, apically divided setae; ampulla and sacculus slightly or not differentiated, covered with very long setae. Aedeagus cylindrical, straight or bent ventrad; inception of bulbus ejaculatorius basal, often on dorsal side of aedeagus; vesica often with one strong cornutus and many smaller, acutely pointed spines.

GENITALIA ♀. Papillae anales slightly to strongly sclerotized, sparsely covered with very long setae. Eighth segment strongly sclerotized, tergite with irregular row of long setae on posterior margin, sternite covered with very long setae. Apophyses anteriores and posteriores of same length or latter slightly longer. Ostium bursae narrow to broad; antrum cylindrical or conical; ductus bursae straight or bent posteriorly; corpus bursae nearly globular; signa present as plates with inwardly directed spines; inception of ductus seminalis near ostium; walls of ductus and corpus bursae often scobinate.

REMARKS. In the right fore wing of the holotype of *isographa*, veins R_4 and R_5 have a short common stalk while the left shows the normal condition with R_4 and R_5 separate. This was noted by Meyrick in the original description; however, Clarke (1955: pl. 192, fig. 1a) illustrated the anomalous wing which is not representative of the venation of the *monotonia*-group.

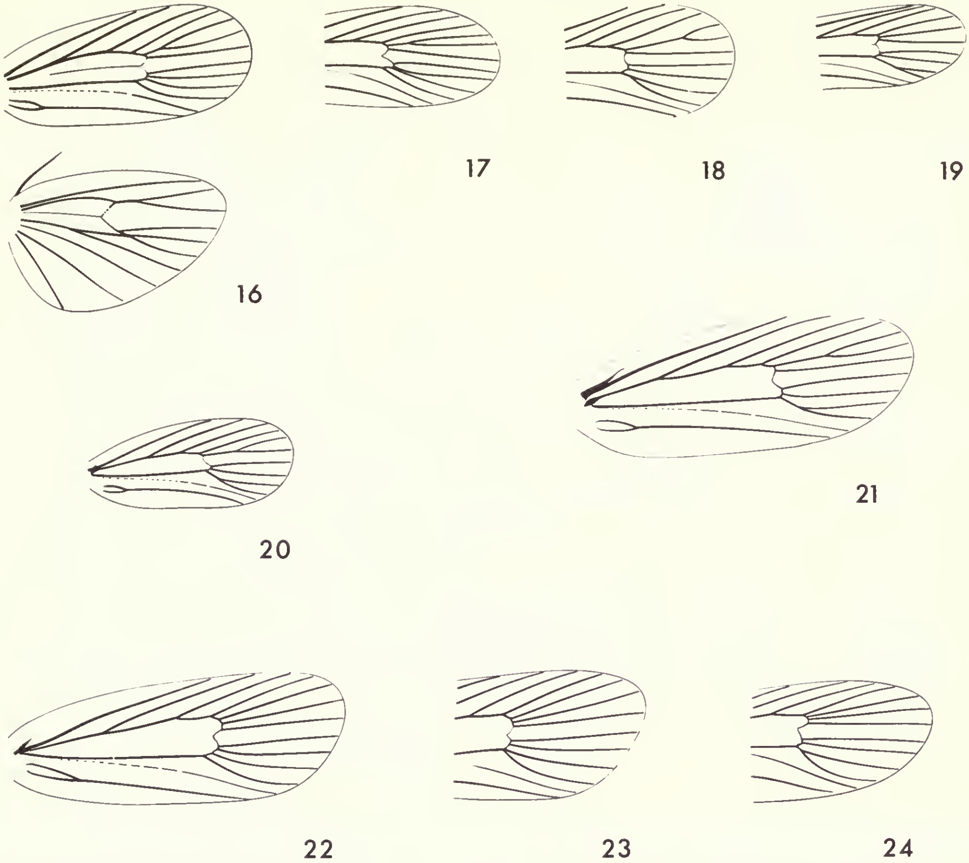


Figs 12–15 Wing venation of *Timocratica* ♂. 12, *T. monotonia* (Strand). 13, *T. palpalis* (Zeller). 14, *T. major* (Busck). 15, *T. leucocapna* (Meyrick).

The non-white *Timocratica* species show some external resemblance to *Thioscelis* Meyrick and *Loxotoma* and probably form the sister-group of the latter. They can easily be distinguished from these genera as *Thioscelis* has unusually long hind legs and *Loxotoma* has conspicuous shades of pink on the hind wings. These two genera also have coremata in pockets on the second abdominal sternite, and the entire valva has strong, apically bifurcated setae. However, in *Loxotoma* the gnathos is divided in the middle and each of the digitate processes of the juxta are split into two branches. *Thioscelis* has an entire gnathos but the valva has a well-developed ampulla, a character absent in *Timocratica.*

PUPA. Pupae of only *palpalis* and *melanocosta* were available for this study, and these show generalized gelechioid characters. However, like other Stenominae, they are slightly flattened dorso-ventrally and have the abdomen sharply curved ventrad, with the fifth, sixth and seventh segments free. They also have strong dorsal incisions on these three segments, allowing dorso-ventral movements only.

Two specializations are not shared by the other known pupae: the two long cremaster processes, called 'anal legs' by Powell (1973: 26), and the peculiar projection of the pronotum



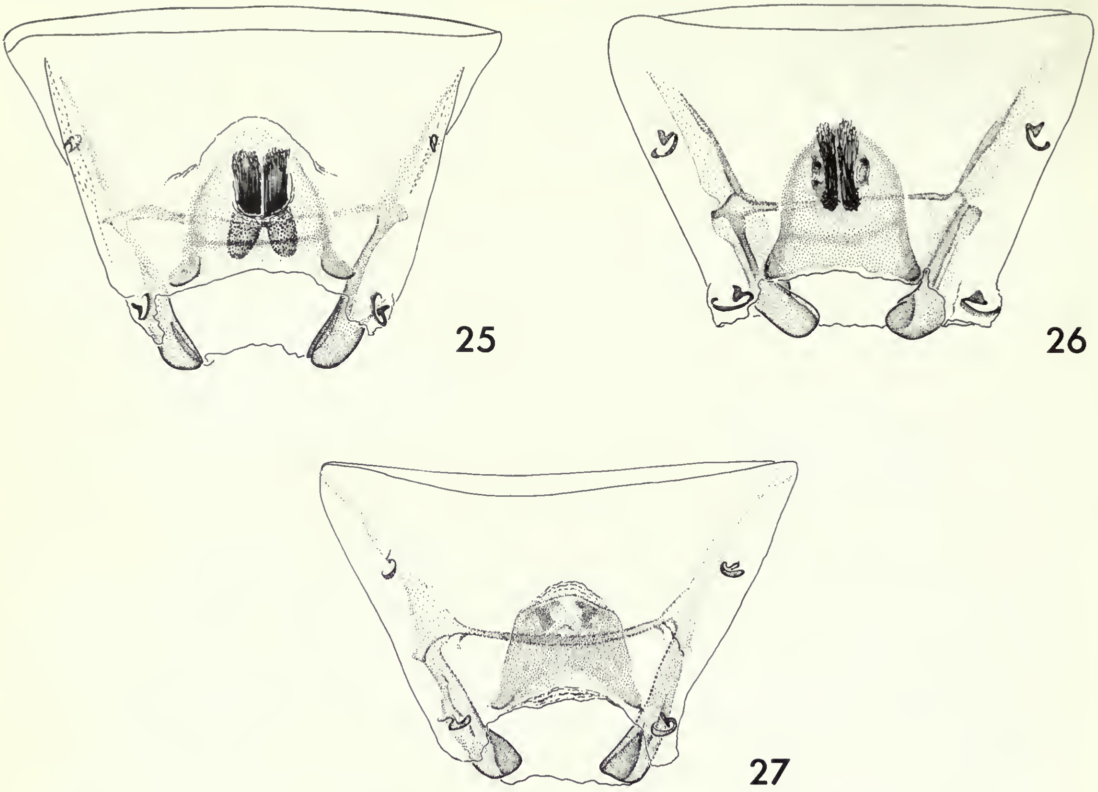
Figs 16–24 Wing venation of *Timocratica* ♂. 16–19, *T. butyrota* (Meyrick). 20, *T. parvifusca* sp. n. 21, *T. venifurcata* sp. n. 22–24, *T. nivea* sp. n.

(Figs 46–48). The 'anal legs', which anchor the pupa to the gallery walls, are also known in other gelechioid groups, such as *Ethmia* Hübner (Ethmiidae) (Powell, 1973: 26) and *Agonoxena* Meyrick (Agonoxenidae) (Bradley, 1966: 468), and it seems likely that they might occur in other Stenominae. For the time being, the expansion of the pronotum can be used to distinguish *palpalis* and *melanocosta* from the other known stenomine pupae.

LARVA. Larvae of only *palpalis* and *melanocosta* were available for this study, both species belonging to the *albella*-group. As this does not include *monotonia*, the type-species of the genus, it is not certain that the characters in these two species are representative of the whole genus.

Apart from these, the larvae (and pupae) of only five other stenomine species have been described: *Antaeotricha dissimilis* (Kearfott) (Becker, 1970), *A. schlaegeri* (Zeller) (Mackay, 1972), *Stenoma crambina* Busck (Dampf, 1929), *S. decora* (Zeller) (Silva & Heinrich, 1946) and *S. ybyrajuba* Becker (Becker, 1971). The available information is therefore inadequate for generalizations to be made about the taxonomic value of characters, and the relationship of the Stenominae with other gelechioid groups, although some characters are very similar in the larvae of all seven species.

Like other gelechioids, stenomine larvae have three prespiracular setae, L1, L2, L3, on the prothorax, and L1 and L2 on the same pinaculum on abdominal segments 1–8. In *Timocratica* and the five species mentioned above, the adfrontal area of the head does not extend to the vertical angle and the distance between setae P2 is the same as or less than the distance between setae P1 (Fig. 39). These characters are also found in the Xyloryctinae, whereas in all other



Figs 25–27 *Timocratica* species, abdominal segments 1–2. 25, *T. monotonia* (Strand). 26, *T. meridionalis* sp. n. 27, *T. loxotoma* (Busck).

gelechioids the distance between setae P2 is greater than that of setae P1, and the adfrontal area reaches the vertical angle of the head, except in some Ethmiidae. According to Powell (1973) the adfrontal area in *Ethmia* often reaches the vertical angle, but in a few species it does not. However, as in other gelechioids, except for Stenominae and Xyloryctinae, the distance between setae P2 is always greater than the distance between setae P1.

In an attempt to trace relationships among the gelechioids I examined the larvae of four Australian Xyloryctinae in the BMNH: *Cryptophasa hyalinopa* Lower, *C. balteata* Meyrick, *Echiomima mythica* Meyrick and *Perixestis eucephala* (Turner). These species also have the adfrontal area not reaching the vertical angle of the head and the distance between setae P2 is almost the same as that between setae P1. Therefore it seems that the combination of both characters of the head, i.e., adfrontal area not reaching the vertical angle and the distance between setae P2 about the same as between setae P1, is a good diagnostic feature for distinguishing the larvae of Stenominae and Xyloryctinae from those of other Gelechioidea.

The larvae of the two species of *Timocratica* described here can be distinguished easily from the other five, as the former have setae D and setae SD on the same pinaculum on both the meso- and metathorax, and a series of extra sclerotized areas, 'pinacula without setae', on the meso- and metathorax and on segments 1–7 of the abdomen.

Key to species and subspecies

Note. The males of *albella, isarga, megaleuca, melanostriga*, species 1, and species 3 to species 7, and the females of *anelaea, constrictivalva, fuscipalpalis, guarani, macroleuca, maturescens, parvifusca, parvileuca, philomela, spinignatha, subovalis, titanoleuca, venifurcata, xanthotarsa, effluxa, agramma, fraternella, longicilia, pompeiana* and species 2 are unknown.

1		Ground-colour of fore wing white (***albella***-group)	14
–		Ground colour of fore wing not white	2
2	(1)	Fore wing with all veins free (***leucocapna***-group)	4
–		Fore wing with not all veins free	3
3	(2)	Fore wing with R_4 and R_5 free (***monotonia***-group)	6
–		Fore wing with R_4 and R_5 stalked	***parvifusca*** (p. 270)
4	(2)	Hind wing edged with fuscous	***effluxa*** (p. 240)
–		Hind wing not edged with fuscous	5
5	(4)	Fore wing of male less than 23 mm	***leucocapna*** (p. 238)
–		Fore wing of male more than 25 mm	species 2 (p. 239)
6	(3)	Apex of fore wing pointed	***major*** (p. 231)
–		Apex of fore wing rounded	7
7	(6)	Hind wing golden-ochreous	9
–		Hind wing yellowish fuscous or dark fuscous	8
8	(7)	Abdomen golden-ochreous	species 1 (p. 237)
–		Abdomen golden-ochreous crossed with fuscous bands	***fraternella*** (p. 237)
9	(7)	Fore wing without distinctive fasciae	***agramma*** (p. 232)
–		Fore wing with three distinctive fasciae	10
10	(9)	Antenna with ciliation clearly longer than diameter of flagellum	***longicilia*** (p. 232)
–		Antenna with ciliation about diameter of flagellum	11
11	(10)	Second abdominal sternite without coremata	***loxotoma*** (p. 236)
–		Second abdominal sternite with coremata	12
12	(11)	Coremata on second abdominal sternite in inverted pockets	13
–		Coremata on second abdominal sternite free, attached to the sternite surface	***meridionalis*** (p. 235)
13	(12)	Male genitalia with margins of valva nearly parallel	***monotonia*** (p. 234)
–		Male genitalia with margins of valva not parallel, converging towards apex	***pompeiana*** (p. 233)
14	(1)	Fore wing plain white	15
–		Fore wing marked with dark fuscous	***melanostriga*** (p. 266)
15	(14)	Hind wing plain golden-yellow	16
–		Hind wing white or tinged with yellow	20
16	(15)	Fore tarsus fuscous	19
–		Fore tarsus golden-ochreous	17
17	(16)	Fore wing with veins CuA_1 and CuA_2 stalked	species 3 (p. 243)
–		Fore wing with veins CuA_1 and CuA_2 not stalked	18
18	(17)	Gnathos basally with long, digitate processes	***constrictivalva*** (p. 243)
–		Gnathos basally without long, digitate processes	***xanthotarsa*** (p. 242)
19	(16)	Mid tarsus fuscous above	***grandis*** (p. 240)
–		Mid tarsus golden-ochreous	***bicornuta*** (p. 241)
20	(15)	Abdomen plain golden-ochreous above	21
–		Abdomen white, or tinged with yellow, or crossed with white bands above	27
21	(20)	Hind wing plain white	22
–		Hind wing tinged with yellow	species 4 (p. 244)
22	(21)	Fore wing with R_4 and R_5 stalked	***venifurcata*** (p. 245)
–		Fore wing with R_4 and R_5 not stalked	23
23	(22)	Fore wing with base of costa fuscous	24
–		Fore wing with base of costa not fuscous	25
24	(23)	Head with vertex golden-yellow	***xanthosoma xanthosoma*** (p. 247)
–		Head with vertex white	***xanthosoma leucocephala*** (p. 247)
25	(23)	Second segment of labial palpus almost fuscous externally	***fuscipalpalis*** (p. 246)
–		Second segment of labial palpus almost ochreous externally	26
26	(25)	Vesica with strong cornutus and many smaller spines	***subovalis*** (p. 243)
–		Vesica with strong cornutus only	***amseli*** (p. 244)
27	(20)	Abdomen golden-ochreous crossed with white bands above	***anelaea*** (p. 248)
–		Abdomen white or tinged with yellow above	28
28	(27)	Hind tarsus plain white	29
–		Hind tarsus golden-yellow, or tinged with yellow	33
29	(28)	Fore tarsus white or mixed with white scales above	30
–		Fore tarsus fuscous above	***isarga*** (p. 266)
30	(29)	Abdomen tinged with yellow above	31
–		Abdomen plain white above	32

31 (30)	Frons white edged with fuscous	***guarani*** (p. 268)
–	Frons plain white	***albella*** (p. 267)
32 (30)	Fore wing with costa dark grey basally	***melanocosta*** (p. 261)
–	Fore wing with costa white basally	***nivea*** (p. 262)
33 (28)	Fore tarsus white above	34
–	Fore tarsus dark fuscous above	36
34 (33)	Abdomen and underside of wings plain white	***albitogata*** (p. 264)
–	Abdomen and underside of wings tinged with yellow	35
35 (34)	Second segment of labial palpus golden-yellow below	***macroleuca*** (p. 248)
–	Second segment of labial palpus dark fuscous below	***titanoleuca*** (p. 248)
36 (33)	Hind wing tinged with yellow above	37
–	Hind wing white above	41
37 (36)	Second segment of labial palpus golden-yellow below	39
–	Second segment of labial palpus dark fuscous below	38
38 (37)	Fore wing with R_4 and R_5 stalked	***butyrota*** (p. 269)
–	Fore wing with all veins free	***parvileuca*** (p. 269)
39 (37)	Abdomen white above	40
–	Abdomen tinged with yellow above	***spinignatha*** (p. 250)
40 (39)	Fore wing more than 20 mm	species 6 (p. 265)
–	Fore wing less than 15 mm	***philomela*** (p. 268)
41 (36)	Second segment of labial palpus white internally	42
–	Second segment of labial palpus almost golden-ochreous	***maturescens*** (p. 252)
42 (41)	Fore femur dark fuscous above	43
–	Fore femur yellow above	44
43 (42)	Fore wing white below along apex and termen	***palpalis*** (p. 253), ***megaleuca*** (p. 253)
–	Fore wing dark fuscous below along apex and termen	***argonais*** (p. 251)
44 (42)	Mid femur yellow above	species 7 (p. 265)
–	Mid femur white above	45
45 (44)	Fore wing more than 25 mm	***leucorectis*** (p. 249)
–	Fore wing less than 20 mm	species 5 (p. 250)

Division of *Timocratica* into species-groups

Except for *parvifusca*, a small species of uncertain position, all species can easily be clustered into three well-defined natural groups: 1) the *albella*-group which includes species with white fore wings (Figs 68–78); 2) the *monotonia*-group whose species have fuscous fore wings with three oblique, nearly parallel fasciae (Figs 55–63); 3) the *leucocapna*-group which includes species with dark fuscous fore wings, without fasciae, but with a diffuse white area beyond the cell and an area of yellow scales on the basal half of the costa (Figs 64–66). *T. parvifusca* (Fig. 67) is a small, dark fuscous species in which the fore wing has R_4 and R_5 and CuA_1 and CuA_2 stalked. The wing-shape, genitalia, wing-venation, and distribution put it very close to *butyrota*, a small white species in the *albella*-group. The fuscous colour of *parvifusca* is presumably due to a secondary loss of the advanced state.

These three species-groups are defined by characters 5–9 (Figs 2, 3), discussed as follows. Character 5 is the apomorphy of the clade comprising the *albella*-group + *leucocapna*-group, 6 is the apomorphy of the *albella*-group, 7 of the *leucocapna*-group, and 8–9 the apomorphies which define the *monotonia*-group (see cladogram, Fig. 2).

The *monotonia*-group

♂, ♀, 14–30 mm. Head, thorax above, and fore wing fuscous. Third segment of labial palpus about two-thirds as long as second, ascending vertex very close to head. Thorax with crest of long, narrow scales (Fig. 9). Fore wing with apex rounded, acute in *major*; CuA_1 and CuA_2 stalked at basal quarter; three oblique, nearly parallel fasciae crossing wing, except in *agramma*. Hind wing often pale to golden-ochreous, fuscous in *fraternella*. Abdomen ochreous, crossed with fuscous bands in *fraternella*; coremata absent in *loxotoma* and *fraternella*, on surface of sternite in *meridionalis* (Fig. 26).

GENITALIA ♂. Digitate processes of juxta not reaching anterior margin of gnathos apex, except in *major*.

REMARKS. The species of this group can easily be distinguished from others by the crest of long scales on the thorax; from the *albella*-group also by their fuscous colour, from the *leucocapna*-group by the stalked veins CuA_1 and CuA_2 of the fore wing, and from *parvifusca* by the larger size and veins R_4 and R_5 free on the fore wing.

Timocratica major (Busck)

(Figs 14, 28, 63, 79, 80, 154)

Stenoma major Busck, 1911: 212, pl. 8, fig. 8. Holotype ♂, PERU: Lima, Callao (*Pusey*) (NMNH) [not examined].
Timocratica major (Busck) Meyrick, 1912: 707 [list]; Busck, 1935: 17 [catalogue].

♂ 22–25 mm. Head pale yellow, ochreous towards clypeus; vertex and crown with grey and ochreous-tipped scales. Second segment of labial palpus ochreous, whitish internally above; third segment whitish. Antenna pale yellow, scape with greyish-tipped scales; flagellum progressively fuscous from base to apex, ciliation half diameter of flagellum. Thorax pale yellow with greyish and ochreous-tipped scales. Fore wing with apex pointed, pale yellow; margins, oblique fasciae, and fold ochreous; underside golden-ochreous. Hind wing pale golden-yellow, cilia golden. Legs ochreous, paler above; fore tarsus dark ochreous on outer side. Abdomen ochreous.

♀ 26 mm. Slightly darker than male. Fore wing irrorate with ferruginous scales; margins, fasciae, fold and cilia ferruginous.

GENITALIA ♂ (Figs 79, 80). Uncus slightly narrowed at middle; apex strongly concave, nearly bifurcate. Apex of gnathos blunt. Digitate processes of juxta narrow and long, overlapping proximal side of gnathos, curved inwards, covered with setae towards apex. Anterior margin of vinculum nearly straight. Valvae progressively broadening distad; sacculus slightly expanded; apex evenly rounded. Aedeagus bent ventrad at base, slightly dilated medially; vesica with single strong cornutus.

GENITALIA ♀ (Fig. 154). Ostium bursae narrow, margin straight. Antrum short. Ductus bursae about twice as long as corpus bursae, nearly cylindrical, walls slightly wrinkled. Corpus bursae globular, walls smooth. Signum an elongate plate, slightly constricted at middle, weakly sclerotized along and across middle.

REMARKS. *T. major* is easily separated by its pointed fore wings; these are rounded in all other species in the group.

Busck (1911) stated that the median and post-median fasciae reach the dorsum, but they merely reach the fold, and on M_3 the post-median forms an acute angle with a fascia that follows the fold, parallel to the tornus. Busck also stated that the alar expanse was 50–60 mm, but it was impossible to find specimens larger than 55 mm amongst the material studied. The presence of a thoracic crest in this species is not clear. All the specimens examined have the thorax more or less rubbed, except one which has some long, loose scales around the pin, which may indicate the presence of this character. The shape of the juxta and valva is somewhat unusual for this group. No other species has the digitate processes of the juxta overlapping the proximal side of the gnathos, nor the characteristic expansion of the sacculus. This is also the only species in the genus with such a long ductus bursae.

DISTRIBUTION (Fig. 28). Brazil (Amazonian Basin and Central Plateau), Peru (Pacific coast [probably erroneous, see below]). This species is presumably associated with Tropical Moist Forest as indicated by the specimens collected in Borba and Fonte Boa, Amazonas (dots in lowest hexagon of Fig. 28). The specimens from 'Callao, Peru' are probably mislabelled as this locality is in a desert area. The specimens from Mato Grosso and Goiás come from an area covered predominantly by two associations. The savanna-type vegetation, called 'cerrado' in Brazil, covers most of the area and is the result of the monsoon-type of rainfall, corresponding to an 'atmospheric association' in Holdridge's system. The other association is represented by gallery-forests along the river banks. These gallery forests represent the climatic association of the area. Thus, the two dots which represent the two localities in Goiás and Mato Grosso (Fig. 28) could be moved further to the right, probably over the 2000-precipitation line, and falling very close to the other two dots which represent the most likely ecological association of *major*.

MATERIAL EXAMINED
8 ♂, 1 ♀ (4 ♂, 1 ♀ genitalia preparations).

Peru: 1 ♂ (paratype), Lima, Callao (*Pusey*) (BMNH). **Brazil**: 5 ♂, Mato Grosso, Rio Brilhante, 22.x.1970 (*Becker*) (VB; BMNH; NMNH); 1 ♀, Amazonas, Fonte Boa, vii.1906 (*Klages*) (BMNH); 1 ♂, Amazonas, Borba, Rio Madeira, x.1943 (*Pohl*) (NMNH); 1 ♂, Goiás, Leopoldo Bulhões, x.1935 (*Spitz*) (BMNH).

Timocratica agramma sp. n.

(Figs 28, 55, 81, 82)

♂ 30 mm. Head fuscous. Labial palpus dark ochreous; second segment above and third segment fuscous. Antenna fuscous. Thorax fuscous, crest dark brown. Fore wing fuscous, costa ferruginous-ochreous, dorsum ferruginous, oblique fasciae indistinct; underside golden-yellow, deep golden-yellow along margins. Hind wing golden-ochreous, cilia and dorsum deep golden-ochreous. Legs deep golden-ochreous, fore tarsus dark fuscous above; third to fifth segments of mid tarsus fuscous brown.

GENITALIA ♂ (Figs 81, 82). Uncus narrow, lateral margins nearly parallel; apex medially concave. Apex of gnathos sharply pointed, strongly sclerotized. Digitate processes of juxta straight, apex with several setae. Valva with margins nearly parallel, basal third of ventral margin slightly sinuous. Aedeagus slightly bent ventrad, vesica with a single strong, pointed cornutus.

REMARKS. *T. agramma* is easily separated from others in this group by the absence of distinctive oblique fasciae on the fore wings.

DISTRIBUTION (Fig. 28). Brazil (Atlantic coast). The data 'Espirito Santo' on the label of the only specimen known are not precise enough. However, it can be assumed that the specimen was collected in the lowlands around the capital, Vitoria, and the species may belong to a transitional association between the Tropical Dry Forest and the Subtropical Moist Forest.

MATERIAL EXAMINED
Holotype ♂, **Brazil**: Espirito Santo (*Johnson*) (NMNH).

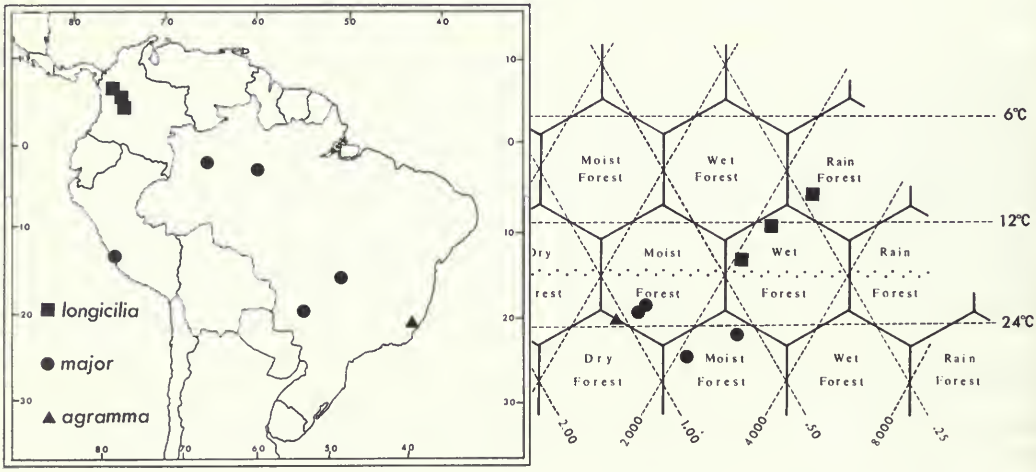


Fig. 28 Geographical and ecological distribution of the *monotonia*-group of *Timocratica*.

Timocratica longicilia sp. n.

(Figs 28, 56, 83–85)

♂ 28–30 mm. Head fuscous, frons whitish edged with ochreous and fuscous scales, vertex and crown brownish fuscous. Second segment of labial palpus dark ochreous, brownish fuscous above; third segment brownish fuscous. Antenna pale yellow, scape fuscous, distal half of flagellum progressively darker towards apex, ciliation one and a half times diameter of flagellum. Thorax fuscous, dark brown along middle, apex of crest scales dark brownish fuscous. Fore wing light fuscous; costa ochreous to ferruginous; termen, dorsum, oblique fasciae and cilia fuscous; golden-yellow below. Hind wing golden-yellow, cilia deep golden-yellow. Legs deep golden-yellow; fore tarsus brownish fuscous above, darker outwardly; mid tarsus slightly tinged with fuscous above. Abdomen deep ochreous, fourth to seventh tergites tinged with brownish fuscous.

GENITALIA ♂ (Figs 83–85). Uncus broad, lateral margins converging slightly towards apex, apex slightly concave. Apex of gnathos folded, not strongly sclerotized as in other species. Digitate processes of juxta short, dorsal side and apex with several setae. Valva very broad, costal margin nearly straight, ventral margin evenly rounded. Aedeagus bent ventrad, vesica with a single, broad-based, sharply pointed cornutus.

REMARKS. *T. longicilia* can easily be distinguished from other species in this group by its relatively long antennal ciliation and by the brownish fuscous third segment of the labial palpus. It is the only species in the group which has the base of the valva narrower than the distal part. Like *major* and *agramma*, from which it is very distinct externally, it has a single strong cornutus in the vesica. The specimen from Antioquia, Mesopotamia has the distal half of the valva slightly narrower than the typical form. Possibly it is a lowland form of the species.

DISTRIBUTION (Fig. 28). Colombia (Oriental Cordillera and Mesopotamia). This species represents the genus in the high mountains of Colombia, in the Tropical Montane and Tropical Lower Montane Wet Forest. No other species in the genus is known to occur in these two Life Zones.

MATERIAL EXAMINED
3 ♂ (2 ♂ genitalia preparations).
Holotype ♂, **Colombia**: Tolima, Mt Tolima, 3200 m (*Fassl*) (BMNH).
Paratypes. **Colombia**: 1 ♂, Tolima, Mt del Éden, Ibagué, 2700 m, xii.1909 (*Fassl*) (BMNH); 1 ♂, Antioquia, Mesopotamia, 1500 m ('5000 ft') (NMNH).

Timocratica pompeiana (Meyrick)

(Figs 29, 57, 86, 87)

Timocratica pompeiana Meyrick, 1925: 176; Busck, 1935: 17 [catalogue]; Clarke, 1955: 391, pl. 195, figs 4–4b [adult, genitalia]. Holotype ♂, PERU (BMNH) [examined].

♂ 27–30 mm. Head whitish, frons edged with fuscous, vertex and crown with fuscous scales. Second segment of labial palpus with basal half ochreous, dark grey above, outer half above and near articulations whitish; third segment whitish, fuscous below. Antenna fuscous; scape whitish, basal half above with fuscous scales. Thorax fuscous, dark fuscous along middle; crest dark brown, patagia pale yellow, tegulae fuscous. Fore wing fuscous, costa deep ochreous to ferruginous brown, termen, dorsum, oblique fasciae and fold ferruginous brown, cilia fuscous, dark ochreous below. Hind wing golden-ochreous, cilia and dorsum deep golden-ochreous. Legs deep golden-ochreous, fore tarsus fuscous above, dark brown on claws; mid tarsus and third to fifth segments of hind tarsus fuscous brown above. Abdomen deep golden-ochreous.

GENITALIA ♂ (Figs 86, 87). Uncus nearly triangular, base broad, tapering strongly towards apex. Apex of gnathos flat and rounded. Digitate processes of juxta straight, dorsal side of apex with several setae. Valva very broad basally, ventral margin strongly curved near middle. Aedeagus bent ventrad at basal third, vesica with strong, bent cornutus and several smaller spines opposite.

REMARKS. *T. pompeiana* is a little larger than *monotonia* but otherwise very similar externally. The only difference is in the shape of the valva; in *pompeiana* it is nearly triangular with a very broad base, while in *monotonia* the margins are almost parallel. *T. pompeiana* could be a local form of *monotonia*, as variation of genitalia has been found in different populations of the latter. This view is supported by the ecological distribution of both forms as discussed below. However, *pompeiana* is retained as a distinct species until further material and information is available.

DISTRIBUTION (Fig. 29). Peru (eastern side of the Andes). All specimens were collected in the same place, the locality being Tropical Premontane Wet Forest. This is also the Life Zone of *monotonia* and suggests that *pompeiana* could be a local form of that species.

MATERIAL EXAMINED
5 ♂ (3 ♂ genitalia preparations).
Peru: holotype ♂, Carabaya, La Oroya (BMNH); 4 ♂, Puno, Carabaya, La Oroya, R. Inambari, iii.1905 (*Ockenden*) (BMNH).

Timocratica monotonia (Strand)

(Figs 6, 9, 12, 25, 29, 58, 88–93, 155)

Cryptolechia monotonia Strand, 1911: 151; 1914: 58, pl. 11, fig. 18 [redescr., adult]. Holotype ♀, Ecuador: Macas (colln *Niepelt*) [not traced].

Timocratica isographa Meyrick, 1912: 707; 1925: 176 [addition to descript.]; Busck, 1935: 17 [catalogue]; Clarke, 1955: 384, pl. 192, figs 1–1d [adult, wing venation, genitalia]. Holotype ♂, Venezuela (BMNH) [examined]. **Syn. n.**

Timocratica claudescens Meyrick, 1925: 177; Busck, 1935: 16 [catalogue]; Clarke, 1955: 387, pl. 193, figs 4–4a [adult, genitalia]. Lectotype ♂, Peru (BMNH), designated by Clarke (1955: 387) [examined]. **Syn. n.**

Timocratica crassa Meyrick, 1925: 177; Busck, 1935: 16 [catalogue]; Clarke, 1955: 388, pl. 194, figs 1–1a [adult, genitalia]. Lectotype ♂, Brazil (BMNH), designated by Clarke (1955: 388) [examined]. **Syn. n.**

Timocratica monotonia (Strand) Busck, 1935: 17 [catalogue].

♂ 20–24 mm, ♀ 26–28 mm. Head whitish fuscous, frons edged with dark ochreous and fuscous scales; vertex and crown with fuscous scales, darker along middle. Second segment of labial palpus deep ochreous, dark grey above, whitish near outer articulation; third segment whitish with dark fuscous scales towards apex, slightly tinged with ochre above. Scape whitish, with fuscous-tipped scales above; flagellum fuscous, diffusely ringed with whitish scales on articulations; ciliation about diameter of flagellum. Thorax fuscous, dark brown along middle, scales whitish basally; tegula slightly edged with ochreous scales; crest dark brown apically. Fore wing fuscous, scales whitish basally; costa deep ochreous to ferruginous brown; termen, dorsum, oblique fasciae and fold ferruginous brown; cilia fuscous, pale ochreous basally; underside dark golden-ochreous. Hind wing golden-ochreous, dorsum and cilia deep golden-ochreous. Legs golden-ochreous; fore tarsus whitish fuscous above, progressively darker distally. Abdomen deep golden-ochreous.

Genitalia ♂ (Figs 88–93). Lateral margins of uncus parallel or narrowing slightly towards apex. Apex of gnathos variable, gradually to abruptly tapered. Juxta with digitate processes straight or with internal margins slightly sinuate. Margins of valva nearly parallel or valva broader at base and strongly angled at one-third; apex evenly rounded. Aedeagus bent ventrad; vesica with several cornuti on dorsal side, several smaller acute spines ventrally.

Genitalia ♀ (Fig. 155). Ostium bursae wide, margin shallowly convex. Antrum conical, anterior part constricted, wrinkled longitudinally. Ductus bursae widening gradually towards corpus bursae. Corpus bursae pear-shaped, walls smooth as in ductus bursae. Signum a single elongate plate.

Remarks. *T. monotonia* is very similar externally to *pompeiana* and *meridionalis*. The former is larger and has the basal half of the valva very broad. The latter has a distinctive lighter area on the basal half of the fore wing and the coremata on the abdomen attached to the sternite surface.

Although there are no good external features to distinguish specimens from different localities, Meyrick described this species three times, giving no evidence as to why he believed they were

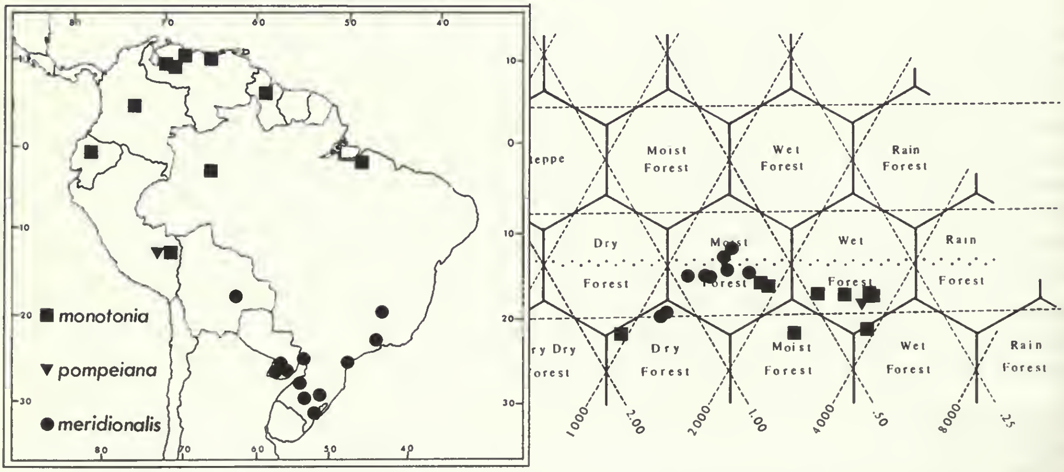


Fig. 29 Geographical and ecological distribution of the *monotonia*-group of *Timocratica*.

different. The male genitalia exhibit slight differences between specimens from different places, but seem to be constant in those from the same locality. This is regarded as geographic variation as specimens from places between the type-localities have intermediate genitalia.

The type of *monotonia* has not been traced. According to Horn & Kahle (1936: 191, 270), Niepelt's collection was sold, the Strand types being deposited in the MNHU and IP. Dr. H.-J. Hannemann and Dr. R. Gaedike of these respective institutions were unable to find the type (pers. comm.), nor could it be traced at the BMNH where part of the Niepelt collection is now deposited.

According to Strand's figure *monotonia* can be associated with only three species: *isographa*, *longicilia*, and *pompeiana*. It is unlikely that it represents either *longicilia* or *pompeiana*, as the former is known only from the high mountains of Colombia, and the latter (which could be a local form of *isographa*) from the type-locality in southern Peru. The third species, *isographa* (with its synonyms *crassa* and *claudescens*), is widely distributed in the north of South America including Ecuador; in my opinion *monotonia* belongs to the same population and is the senior name for this species.

DISTRIBUTION (Fig. 29). Brazil (Amazonian Basin), Guyana, Colombia, Ecuador, Peru, Venezuela.

Despite its wide geographic distribution, this species appears to be associated mainly with only two Life Zones, Tropical Moist Forest and Tropical Premontane Wet Forest. The specimen from Palma Sola, Venezuela, which is in the Tropical Dry Forest, presumably is associated with gallery forests in this savanna area.

MATERIAL EXAMINED

21 ♂, 3 ♀ (11 ♂, 2 ♀ genitalia preparations).

Brazil: lectotype ♂ of *T. crassa*, Pará, Belém, vii.1919 (Parish) (BMNH); 8 ♂, Pará, Belém ['Pará'] (*Moss*) (BMNH); 1 ♂, 1 ♀, Amazonas, Fonte Boa (*Klages*) (BMNH). **Guyana**: 1 ♂, Essequibo, Potaro, v.1908 (*Klages*) (BMNH). **Colombia**: 1 ♂, Cundinamarca, Medina (*Fassl*) (BMNH). **Ecuador**: 1 ♀, Pichincha, Santo Domingo de los Colorados, 14.ii.1959 (*Hodges*) (NMNH). **Venezuela**: holotype ♂ of *T. isographa*, Falcón, Palma Sola (BMNH); 1 ♂, Aragua, Rancho Grande, 4.vi.1968 (*Feige*) (VB); 1 ♂, 1 ♀, same data, 1100 m, 10.iv, 10.v.1967 (*Salcedo & Rodriguez*) (VB); 1 ♂, Falcón, Palma Sola (BMNH); 2 ♂, Las Quinguas, near Sán Esteban (*Klages*) (BMNH); 1 ♂, Sán Esteban (*Klages*) (BMNH). **Peru**: lectotype ♂ of *T. claudescens*, Puno, Sán Gabán, iv.1913 (BMNH); 1 ♂ (paralectotype of *T. claudescens* Meyrick), Puno, Sán Gabán [river], 760 m ('2500 ft'), iv.1913 (NMNH).

***Timocratica meridionalis* sp. n.**

(Figs 26, 29, 59, 94, 95, 156)

[*Timocratica claudescens* Meyrick; Biezanko, 1961*b*: 6. Misidentification.]

♂ 23–28 mm. Head whitish, frons edged with ferruginous, vertex and crown dark fuscous along middle. Second segment of labial palpus dark ochreous, whitish with fuscous scales above and around distal articulations; third segment whitish with fuscous scales below. Scape whitish fuscous above; flagellum whitish at base, progressively fuscous towards apex. Thorax light fuscous, ferruginous brown along middle; crest dark brown apically; tegula edged with ochreous scales. Fore wing light fuscous; basal half between *R* and costa whitish; costa ochreous to ferruginous; apex, termen, tornus, and oblique fasciae ferruginous brown; fold with ochreous scales; cilia fuscous; underside dark ochreous. Hind wing golden-ochreous, cilia and dorsum deep golden-ochreous. Legs deep golden-ochreous; fore tarsus whitish with grey scales above, progressively dark brown outwards; mid tarsus dark fuscous brown above; third to fifth segments of hind tarsus fuscous brown. Abdomen deep golden ochreous.

♀ 26–30 mm. Lighter than male; second segment of labial palpus without grey scales above.

GENITALIA ♂ (Figs 94, 95). Uncus narrow, lateral margins progressively convergent towards apex; apex rounded. Apex of gnathos short, blunt. Digitate processes of juxta nearly straight, distal half dorsally and apex with several long setae. Valva strongly curved near basal third, then with margins almost parallel; apex evenly rounded. Aedeagus bent ventrad, slightly narrower at middle; vesica with short, bent cornutus and few sharply pointed, smaller spines.

GENITALIA ♀ (Fig. 156). Margin of ostium bursae straight. Antrum with lateral margins almost parallel. Ductus bursae broadening progressively towards corpus bursae. Corpus bursae pear-shaped. Signum a single plate, weakly sclerotized along middle.

REMARKS. *T. meridionalis*, the southern species in the group, is very similar to *monotonia* but can easily be distinguished by the lighter area on the basal half of the fore wing between *R* and the costa, and by the genitalia. Although this species also has coremata on the second abdominal sternite, these are not located in pockets but are attached to the sternite surface (Fig. 26). This is probably an intermediate development between *loxotoma* and *fraternella* which lack coremata, and the remaining species of the genus which have them located in pockets (Fig. 25).

It was impossible to examine the material studied by Biezanko (1961*b*: 6), but it certainly belongs to *meridionalis* and not to *claudescens* which is a synonym of *monotonia*, a species occurring in the tropical areas of northern South America.

BIOLOGY. Like *palpalis*, this species emerges earlier (October) in the northern and warmer areas of its range, and later (February to March) in the southern areas. This seems to indicate that it is univoltine in southern, colder regions, but further collecting from the northern and warmer localities may show that it is bivoltine in these areas.

DISTRIBUTION (Fig. 29). Southern Brazil, Paraguay and Bolivia. This species is the only representative of the *monotonia*-group in the Warm Temperate and Subtropical regions of South America. It is restricted to two Life Zones, Warm Temperate Moist Forest and Subtropical Lower Montane Moist Forest.

MATERIAL EXAMINED

21 ♂, 8 ♀ (7 ♂, 2 ♀ genitalia preparations).

Holotype ♂, **Brazil**: Paraná, Curitiba, 920 m, 12.iii.1975 (*Becker*) (MN).

Paratypes. **Brazil**: 1 ♂, 1 ♀, Minas Gerais, Sete Lagoas, 720 m 18–20.x.1969 (*Becker*) (VB); 1 ♂, São Paulo, Ipiranga, iii.1926 (*Spitz*) (BMNH); 1 ♀, São Paulo, São Bernardo, iii.1926 (*Spitz*) (BMNH); 2 ♂, 1 ♀, São Paulo, Piracicaba, 14–19.i.1966 (ESALQ); 9 ♂, 4 ♀, Paraná, Curitiba, 920 m, 15.ii-20.iii.1975 (*Becker*) (VB; BMNH; NMNH; MNHU; NM); 1 ♂, 1 ♀, Paraná, Iguaçu, 20.ii-5.iii.1922 (BMNH); 1 ♂, Rio Grande do Sul, Elsenau, 1905 (*Martin*) (BMNH); 1 ♂, Rio Grande do Sul, Santa Maria, 25.iii.1971 (*Link*) (VB); 1 ♂, Rio Grande do Sul, Pelotas, 14.ii.1961 (*Biezanko*) (VB). **Bolivia**: 1 ♀, Santa Cruz, Prov. del Sara, 450 m (*Steinbach*) (BMNH). **Paraguay**: 1 ♀, Ibapá, 20.x.1924 (BMNH); 1 ♂, Sapucay, 20.i.1905 (*Forster*) (BMNH); 1 ♂, Villa Rica (*Jörgensen*)) (NMNH).

Excluded from type-series. [South Africa:] 1 ♂, Natal, Stellenbosch (*C.K.B.*) (BMNH) [mislabelled].

Timocratica loxotoma (Busck)

(Figs 27, 30, 60, 96, 97, 157)

Stenoma loxotoma Busck, 1910: 212; Walsingham, 1913: 179 [list]. Holotype ♂, MEXICO: Vera Cruz, Orizaba, vi (*Müller*) (NMNH) [not examined].
Timocratica loxotoma (Busck) Busck, 1935: 17 [catalogue].

♂ 20-22 mm. Head whitish, frons edged with fuscous, vertex and crown with fuscous scales along middle. Second segment of labial palpus deep ochreous below, dark fuscous above, pale distally, third segment pale fuscous. Antenna whitish fuscous. Thorax fuscous above, dark fuscous along middle, apical half of crest scales dark fuscous brown. Fore wing light fuscous; costa, apex, termen, dorsum, oblique fasciae and fold ferruginous brown; cilia fuscous. Hind wing and underside of fore wing golfen-ochreous. Legs deep golden-ochreous; fore tarsus light fuscous above, dark fuscous on claws, mid tarsus progressively dark fuscous towards claws. Abdomen deep golden-ochreous above, paler below.

♀ 22–28 mm. Slightly paler than male. Second segment of labial palpus without fuscous tinge above.

GENITALIA ♂ (Figs 96, 97). Margins of uncus nearly parallel, apex slightly concabe. Digitive expansions of juxta nearly straight, with few setae apically. Margins of valva nearly parallel. Aedeagus bent ventrad, vesica with several long spines dorsally.

GENITALIA ♀ (Fig. 157). Margin of ostium bursae expanded posteriorly, concave medially. Antrum slightly constricted at middle, with longitudinal wrinkles anteriorly. Ductus bursae broadening progressively towards corpus bursae. Corpus bursae globular, walls smooth. Signum an elongate plate weakly sclerotized at middle.

REMARKS. Although this Central American species is very similar to *monotonia* externally, it can easily be distinguished in the male as it lacks coremata on the second abdominal sternite (Fig. 27). The female can be distinguished by the shape of the margin of the ostium bursae and by the wide, globular corpus bursae.

Distribution (Fig. 30). Mexico (Gulf of Mexico and Yucatán Peninsula), Guatemala and Costa Rica. This species is associated with a wide range of Life zones and has been collected from Tropical Dry Forest and Tropical Moist Forest, up to Tropical Premontane Wet Forest.

Material examined

13 ♂, 5 ♀ (3 ♂, 2 ♀ genitalia preparations).

Mexico: 1 ♂ paratype, Veracruz, Veracruz (*Schwarz*) (BMNH); 3 ♂, Veracruz, Huatuxco (BMNH); 3 ♂, Campeche, Escarcega, 30.ix.1973 (*Becker*) (VB); 1 ♂, Sán Luiz Potosi, Palitla, 5.viii.1966 (*Flint*) (NMNH); 1 ♂, Sán Luiz Potosi, Tamazunchale, 26.vi.1965 (*Flint*) (NMNH). **Guatemala**: 1 ♂, Chejel, vi (*Schaus*) (NMNH); 1 ♂, Petén, Tikal, 19–22. ix.1973 (*Becker*) (VB). **Costa Rica**: 3 ♀, Cartago, Turrialba, 10.ix.1971, 10.x.1971, 10.xii.1971 (*Becker*) (VB); 1 ♀, Cartago, Turrialba, 10.vi.1972 (*Becker*) (BMNH).

Timocratica species 1

(Figs 30, 62, 158)

♀ 23–24 mm. Similar to *loxotoma* and *monotonia*. Hind wing yellowish-fuscous. Abdomen golden-ochreous.

Genitalia ♀ (Fig. 158). Margin of ostium bursae rounded, expanded posteriorly. Antrum slightly constricted posteriorly, anterior half wrinkled longitudinally. Ductus bursae constricted posteriorly, widening progressively towards corpus bursae, wrinkled longitudinally. Corpus bursae globular. Signum a nearly circular, diffuse plate.

Remarks. The two females considered here are very similar to *loxotoma* and *monotonia* but their hind wings are yellowish-fuscous, not golden-ochreous. The genitalia are very close to those of *loxotoma* but the margin of the ostium bursae is evenly rounded, whereas it is concave in *loxotoma*. Their yellowish-fuscous hind wings suggest some relationship with *fraternella*, and they could well represent the female of that species, but as they are very much lighter and in poor condition it seems better not to name them until more material is available for study.

Distribution (Fig. 30). Costa Rica (known only from Turrialba). This species occurs with *fraternella* in the same Life Zone, viz., Tropical Premontane Wet Forest.

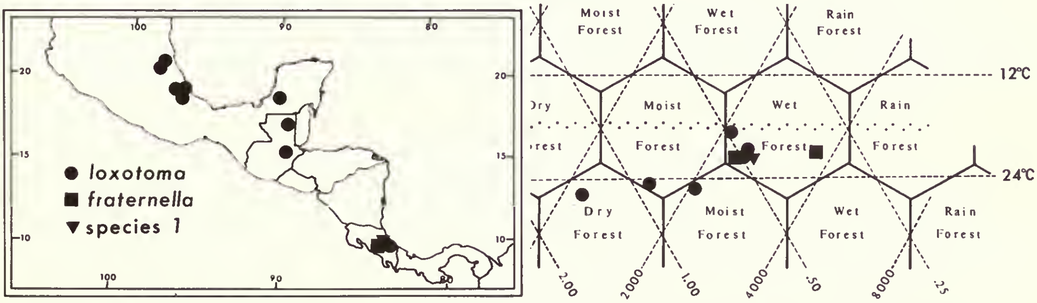


Fig. 30 Geographical and ecological distribution of the *monotonia*-group of *Timocratica*.

Material examined

2 ♀ (2 ♀ genitalia preparations)

Costa Rica: 2 ♀, Cartago, Turrialba, 600 m, 15.vii, 20.x.1972 (*Becker*) (VB; BMNH).

Timocratica fraternella (Busck)

(Figs 30, 61, 98, 99)

Stenoma fraternella Busck, 1910: 80; Walsingham, 1913: 179 [list]. Holotype ♂, Costa Rica: Cartago, Juán Viñas (*Schaus*) (NMNH) [not examined].

Timocratica fraternella (Busck) Busck, 1935: 16 [catalogue].

♂ 14–19 mm. Head whitish, frons edged with fuscous; crown with fuscous scales along middle. Labial palpus bright fuscous, second segment dark fuscous above, third segment progressively dark fuscous towards apex.

Antenna fuscous, scape whitish. Thorax fuscous, apex of crest scales dark brownish-fuscous, metascutum and first abdominal tergite yellowish-fuscous. Fore wing dark shiny fuscous, costa edged with deep ochre; termen, dorsum, oblique fasciae and fold dark brownish-fuscous. Hind wing dark shiny fuscous. Legs deep golden-ochreous; fore tarsus light fuscous above, dark fuscous distally; mid tarsus dark fuscous above; hind claws dark fuscous. Abdomen deep golden-ochreous; tergites crossed with dark fuscous bands near articulations.

GENITALIA ♂ (Figs 98, 99). Uncus slightly dilated medially. Apex of gnathos short, blunt. Digitate processes of juxta straight, gently narrowed at middle; dorsal side of apex with several short setae. Valva with margins nearly parallel, ventral margin evenly rounded at basal third. Aedeagus with basal third strongly curved ventrad; vesica with several spines on dorsal side, progressively longer distally.

REMARKS. *T. fraternella* is easily separated from other species in this group by its dark fuscous hind wings, and from *parvifusca* by its oblique fasciae on the fore wings. The male genitalia are very similar to those of *loxotoma* and, as in that species, lack the pair of coremata on the second abdominal sternite.

DISTRIBUTION (Fig. 30). Costa Rica. Known only from the type-locality, Juán Viñas, and Turrialba, about 20 km distant. Both localities are in Tropical Premontane Wet Forest.

MATERIAL EXAMINED
5 ♂ (2 ♂ genitalia preparations).
Costa Rica: 1 ♂, 1910 (*Lankaster*) (BMNH); 1 ♂ paratype, Cartago, Juán Viñas (*Schaus*) (BMNH); 2 ♂, Cartago, Turrialba, 10.xi.1971 (*Becker*) (VB); 1 ♂, Cartago, Turrialba, 10.v.1973 (*Becker*) (VB).

The *leucocapna*-group

♂, ♀, 18–26 mm. Head whitish, vertex with fuscous or brownish scales. Third segment of labial palpus one-third length of second, nearly straight. Thorax without crest of long scales, covered with fuscous and whitish scales. Fore wing elongate; basal half of costa nearly straight, distal half evenly rounded, apex acutely angled; veins free; dark fuscous, basal half with yellow scales between *Rs* and costa, diffuse whitish area crossed with dark fuscous veins beyond cell. Hind wing golden-yellow. Abdomen golden-yellow with dark fuscous scales on tergites in some specimens; coremata located in pockets.

GENITALIA ♂. Digitate processes of juxta not reaching anterior margin of gnathos apex.

REMARKS. This group can be easily distinguished from the *monotonia*-group and *parvifusca* by the free veins of the fore wing, and from the *albella*-group by the dark fuscous fore wings.

Timocratica leucocapna (Meyrick) **comb. rev.**

(Figs 5, 8, 15, 31, 66, 100, 101, 159)

Lychnocrates leucocapna Meyrick, 1926: 227; Clarke, 1955: 224, pl. 112, figs 1–1d [adult, wing venation, genitalia]. Holotype ♂, COLOMBIA (BMNH) [examined].
Timocratica leucocapna (Meyrick) Busck, 1935: 17 [catalogue].

♂ 18–22 mm, ♀ 26 mm. Head whitish, frons light ochreous, progressively deep ochreous towards clypeus, vertex suffused with fuscous. Haustellum covered with white scales at base. Second segment of labial palpus ochreous, slightly tinged with fuscous below near distal articulations, white dorsally; third segment white, dark fuscous below. Antenna with scape whitish, slightly tinged with ochreous, flagellum white basally, basal half ochreous suffused with fuscous, then progressively ochreous towards apex. Thorax whitish, suffused with fuscous; patagium whitish; tegula light fuscous. Fore wing dark fuscous, basal half between *Rs* and costa ochreous with white scales; a large, diffuse, whitish area beyond cell, crossed with dark fuscous veins; cilia dark fuscous with white dots near veins; underside ochreous. Hind wing light to golden-ochreous. Legs ochreous, fore tibia and tarsus dark fuscous with white scales on articulations, mid and hind tarsi with dark fuscous scales above. Abdomen ochreous, some specimens with third to sixth tergites dark fuscous.

GENITALIA ♂ (Figs 100, 101). Uncus with lateral margins nearly parallel, posterior margin concave, slightly broadened in some specimens. Apex of gnathos pointed, bent posteriorly. Digitate processes of juxta straight or bent gently inwards near apex, apex with several setae. Valva with margins nearly parallel or somewhat broadened at middle. Aedeagus bent ventrad; vesica with two cornuti, a strong one and another smaller, on the opposite side.

GENITALIA ♀ (Fig. 159). Ventral margin of ostium bursae expanded posteriorly, falcate at middle. Antrum slightly constricted anteriorly. Ductus bursae twisted posteriorly, nearly cylindrical, broadening progressively towards corpus bursae. Corpus bursae nearly globular. Signum a single irregular plate.

REMARKS. *T. leucocapna* is easily distinguished from *effluxa* by the absence of fuscous on the hind wing margins. The specimens from Turrialba, Costa Rica, have the abdomen plain golden-ochreous; some have the hind wings deep golden-ochreous.

DISTRIBUTION (Fig. 31). Costa Rica, Colombia, Peru and Venezuela. Despite its wide geographical distribution this species appears to be confined to a single Life Zone, Tropical Premontane Wet Forest.

MATERIAL EXAMINED
16 ♂, 1 ♀ (5 ♂, 1 ♀ genitalia preparations).

Costa Rica: 1 ♂, 1 ♀, Cartago, Turrialba, 600 m, 17–22. ii.1965 (*Duckworth*) (NMNH); 5 ♂, Cartago, Turrialba, 15.vii, 10.ix.1971, 10.iv.1972 (*Becker*) (VB; BMNH). **Colombia**: holotype ♂, Cundinamarca, Medina, 500 m ('1650 ft') (BMNH); 2 ♂, Cundinamarca, Medina (*Fassl*) (BMNH). **Peru**: 3 ♂, La Oroya, R. Inambari, 1000 m ('3100 ft'), iii, xi-xii.1906 (*Ockenden*) (BMNH). **Venezuela**: 2 ♂, Barinas, La Chimenea, 5 km south La Soledad, 1500 m, 28–29.v.1975 (*Dietz*) (VB; UCV); 1 ♂, Lara, Anzoategui, Quebrada Guacó, 1440 m, 13–16.vi.1972 (*Salcedo & Zambrano*) (UCV).

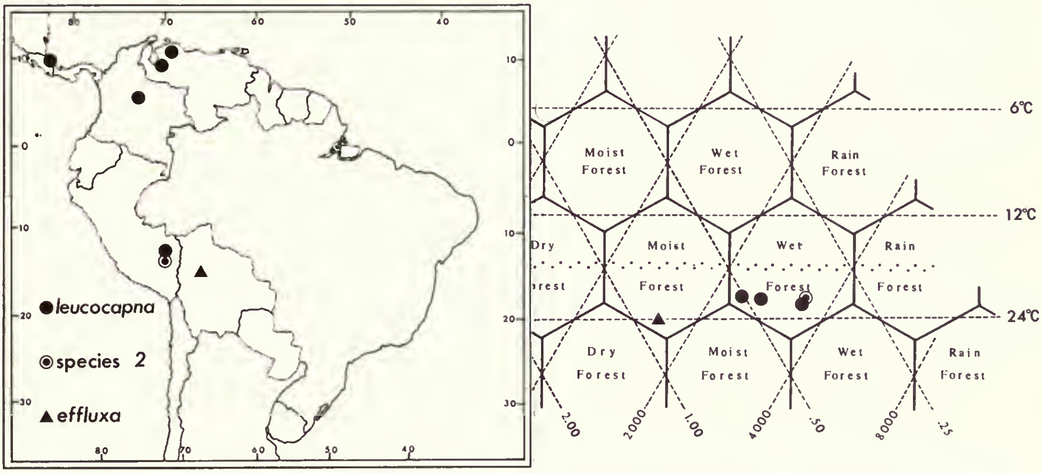


Fig. 31 Geographical and ecological distribution of the *leucocapna*-group of *Timocratica*.

***Timocratica* species 2**

(Figs 31, 65)

♂ 26 mm. Similar to *leucocapna*. Fore wing with the ochreous area on the basal half less pronounced; area beyond cell darker.

GENITALIA ♂. Similar to those of *leucocapna*.

REMARKS. The only specimen representing this form was collected in the same locality as three specimens of typical *leucocapna*. It is larger than any male of the series representing *leucocapna* and quite distinctive, but its genitalia are almost identical. As in *effluxa*, more material is necessary to clarify this form.

DISTRIBUTION (Fig. 31). Peru (eastern slopes of the Andes), in Tropical Premontane Wet Forest, a Life Zone where *leucocapna* also occurs.

MATERIAL EXAMINED

Peru: 1 ♂, Puno, La Oroya, Rio Inambari, 1000 m ('3100 ft'), iii.1905 (*Ockenden*) (BMNH).

Timocratica effluxa (Meyrick)

(Figs 31, 64, 102, 103)

Lychnocrates effluxa Meyrick, 1930; 19. Holotype ♂, BOLIVIA (BMNH) [examined].
Timocratica effluxa (Meyrick) Busck, 1935: 16 [catalogue]; Clarke, 1955: 388, pl. 194, figs 2–2b [adult, genitalia].

♂ 20 mm. Head whitish, tinged with light ochreous; vertex with long brownish-fuscous scales. Second segment of labial palpus ochreous, dark fuscous above; third segment white basally, with dark fuscous scales towards apex. Antenna fuscous, scape with white scales, distal half of flagellum with ochreous scales. Thorax fuscous, with white scales. Fore wing dark fuscous, veins darker than ground colour, sparsely mixed with white scales; white streak poorly defined at base, between *Rs* and *Sc*; a diffuse white area crossed with fuscous veins beyond cell, not reaching margins; cilia dark fuscous with white spots near veins; underside ochreous, distal quarter fuscous. Hind wing ochreous, termen and dorsum fuscous; cilia fuscous. Legs ochreous, fore tarsus dark fuscous, mid and hind tarsi with dark fuscous scales.

GENITALIA ♂ (Figs 102, 103). Similar to *leucocapna*.

REMARKS. *T. effluxa* is easily recognized by the fuscous borders of its hind wings. Although its genitalia are almost identical to those of *leucocapna* it seems to be a distinct species. The colour pattern of the wings in *leucocapna* shows little variation, the hind wings are plain golden-ochreous and the fore wings have a distinctive ochreous area on the basal half between *Rs* and the costa. All these features are absent in *effluxa*.

DISTRIBUTION (Fig. 31). Bolivia. The type-locality is in Subtropical Moist Forest.

MATERIAL EXAMINED

Bolivia: holotype ♂, La Paz, Rio Songo, 750 m (*Fassl*) (BMNH).

The *albella*-group

♂, ♀, 9–32 mm. Head, thorax and ground-colour of fore wing white. Third segment of labial palpus half to same length as second. Thorax without crest of scales. Fore wing elongate, subrectangular or suboval; veins free, or CuA_1 and CuA_2, or R_4 and R_5, or both, stalked; plain white above except for *melanostriga* and *parvifusca*; white below, tinged with golden-yellow, and/or fuscous along apex and termen. Hind wing white, golden-yellow or tinged with yellow. Abdomen golden-ochreous, tinged with golden-yellow or white above, white below; coremata located in pockets.

GENITALIA ♂. Digitate processes of juxta often reaching anterior margin of gnathos apex.

REMARKS. The species of this group can easily be recognized by the white ground-colour of the fore wings. *T. parvifusca* is the only fuscous species in this group but is easily separated from other fuscous species by the stalked R_4 and R_5 of the fore wing.

Timocratica grandis (Perty)

(Figs 32, 69, 104, 105, 160)

Yponomeuta grandis Perty, [1833]: 163, pl. 32, fig. [12] [legend of figure transposed with *Pyralis bahiensis* Perty]. Holotype [♂ ?], BRAZIL: Piaui (*Spix & Martius*) (lost).
Cryptolechia grandis (Perty) Zeller, 1854: 378 [transcription]; Felder & Rogenhofer, 1875: pl. 139, fig. 56 [adult]; Zeller, 1877: 260 [list].
[*Cryptolechia bahiensis* (Perty); Walker, 1864: 712 [catalogue; name quoted from figure legend in Perty, [1833]: pl. 32, fig. 12].]
Stenoma grandis (Perty) Walsingham, 1913: 185 [catalogue].
Timocratica grandis (Perty) Busck, 1935: 16 [catalogue].

♂ 22–26 mm. Frons yellowish-fuscous. Second segment of labial palpus dark fuscous, outer half above and internally white, with yellowish-fuscous scales below; third segment white, progressively dark grey internally towards apex. Antenna with scape and base of flagellum white, progressively fuscous to apex. Legs golden-ochreous, fore tibia and tarsus greyish-fuscous above. Fore wing with apex, termen and tornus evenly rounded; all veins free; underside golden-yellow, slightly tinged with fuscous along apex. Hind wing golden-yellow. Abdomen golden-ochreous, first tergite and all sternites white.

♀ 28–30 mm. Fore wing broader than in male. Hind wing deep golden-yellow.

GENITALIA ♂ (Figs 104, 105). Uncus slightly narrowed at base, apex strongly concave. Apex of gnathos pointed. Digitate processes of juxta very long, reaching middle of gnathos, distal half of dorsal side with sparse setae. Margins of valva nearly parallel. Aedeagus bent ventrad; vesica with cornutus undeveloped, represented as a sclerotized area, and with many small acutely pointed spines.

GENITALIA ♀ (Fig. 160). Margin of ostium bursae expanded posteriorly, slightly concave at middle. Antrum cylindrical. Ductus bursae straight, nearly cylindrical, posterior quarter sclerotized, with few longitudinal wrinkles. Corpus bursae oblong, walls, as in ductus bursae, densely scobinated. Signum an elongate plate constricted at middle, concave at both extremities.

REMARKS. *T. grandis* has golden-yellow hind wings and is thus very similar to *bicornuta*, *constrictivalva* and *xanthotarsa*. However, it can be easily distinguished from *bicornuta* by its fuscous fore tibiae, and from the other two species by its fuscous fore tarsi.

One female from French Guiana has veins CuA_1 and CuA_2 of the fore wing stalked.

In pl. 32 of Perty's work two species of Stenominae are illustrated. Fig. 12 represents a large species with white fore wings and yellow hind wings, named *Pyralis bahiensis*; fig. 13 represents a smaller species with pale wings and black markings on the fore wings, named *Yponomeuta grandis*. However, as may easily be recognized from the descriptions, there is no doubt that the legends were transposed and the large white species represents *grandis*, while the smaller represents *bahiensis*. With the exception of Walker (1864), all subsequent authors (Zeller, 1854, 1877, Felder & Rogenhofer, 1875, Walsingham, 1913 and Busck, 1935), recognized fig. 12 as representing *grandis*.

In the BMNH and NMNH there were series totalling 25 specimens with white fore wings and golden-yellow hind wings; these were identified as *grandis* and agreed with Perty's fig. 12. Upon closer examination it was found that they represent four distinct species. In the absence of other evidence it seems reasonable to apply the name *grandis* to the only species with golden-yellow hind wings of this complex known to occur in the Amazon Basin of Brazil (type-locality of *grandis*). According to Horn & Kahle (1936: 206), Perty's types were deposited in the ZSBS. Dr Dierl informed me (pers. comm.) that the types cannot be found in that Museum and are believed to have been destroyed during World War II.

DISTRIBUTION (Fig. 32). Brazil (Amazon Basin), French Guiana, Panama. Despite its wide distribution, this species appears to be restricted to a single Life Zone, Tropical Moist Forest. It is interesting that the other species with the hind wings and abdomen golden-ochreous, except for *bicornuta*, were also collected in this Life Zone.

MATERIAL EXAMINED

11 ♂, 6 ♀ (3 ♂, 1 ♀ genitalia preparations).

Brazil: 1 ♂, Amazonas, São Paulo de Olivença (*Staudinger*) (MNHU); 1 ♂, Pará, Belém ('Pará') ([*Bates*]) (BMNH); 1 ♂, 3 ♀, Pará, Belém ('Pará') (*Moss*) (BMNH). **French Guiana**: 1 ♂, Guyanne, Cayenne (*Felder*) (BMNH); 2 ♂, 1 ♀, Guyanne, Cayenne (*Deyrolle*) (BMNH); 1 ♂, Guyanne, Cayenne (BMNH); 2 ♂, Guyanne, St Jean, R. Maroni (*Le Moult*) (BMNH); 2 ♀, Guyanne, R. Maroni (*Bar*) (BMNH). **Panama**: 2 ♂, Canal Zone, Barro Colorado Island, 10–17.v.1964 (*Duckworth*) (NMNH).

Timocratica bicornuta sp. n.

(Figs 32, 110, 111, 161)

♂ ♀ 18–20 mm. Frons white, edged with fuscous. Second segment of labial palpus with proximal half tinged with ochreous below, distal half fuscous, dark fuscous above, except near articulations; third segment white, dark grey internally. Antenna white; flagellum somewhat yellow towards apex. Legs golden-yellow, fore tarsus dark fuscous above. Fore wing with apex rounded or somewhat angled, all veins free; underside golden-yellow, slightly tinged with fuscous along apex and termen. Hind wing golden-yellow. Abdomen golden-yellow, first tergite and all sternites white.

GENITALIA ♂ (Figs 110, 111). Uncus with lateral margins parallel, apex concave. Apex of gnathos blunt. Digitate processes of juxta bent outwards, diverging progressively from each other towards apex, with long setae apically. Valva long, narrow, lateral margins nearly parallel. Aedeagus bent ventrad at basal third, vesica with two strong bent cornuti opposite each other.

Genitalia ♀ (Fig. 161). Margin of ostium bursae with two small posteriorly directed lobes. Antrum very broad medially. Ductus bursae somewhat broadened towards corpus bursae. Corpus bursae nearly globular, walls, as in ductus bursae, densely scobinate. Signum a rectangular plate.

Remarks. *T. bicornuta* is easily separated from *xanthotarsa* and *constrictivalva* by its fuscous fore tarsi, and from *grandis* by its yellow fore tibiae. It is also the only species in the group with two strong cornuti in the vesica.

The only known female agrees in every detail with the males but is doubtfully associated with this species.

Distribution (Fig. 162). Brazil (south-eastern coast), French Guiana. The holotype of this species, the only Brazilian specimen bearing detailed data, was collected in Subtropical Lower Montane Wet Forest. The female from French Guiana came from Tropical Moist Forest, like the others of the *grandis* complex. This difference in ecological adaptation may indicate that the female belongs to a different species.

Material examined

3 ♂, 1 ♀ (3 ♂, 1 ♀ genitalia preparations).

Holotype ♂, **Brazil**: Rio de Janeiro, Pico do Itatiaia, 28.iii–1.iv.1958 (*Kettlewell*) (BMNH).

Paratypes. **Brazil**: 2 ♂ (*Ragonot*) (BMNH).

Excluded from types-series. **French Guiana**: 1 ♀, Guyanne, St Jean, R. Maroni (*Le Moult*) (BMNH).

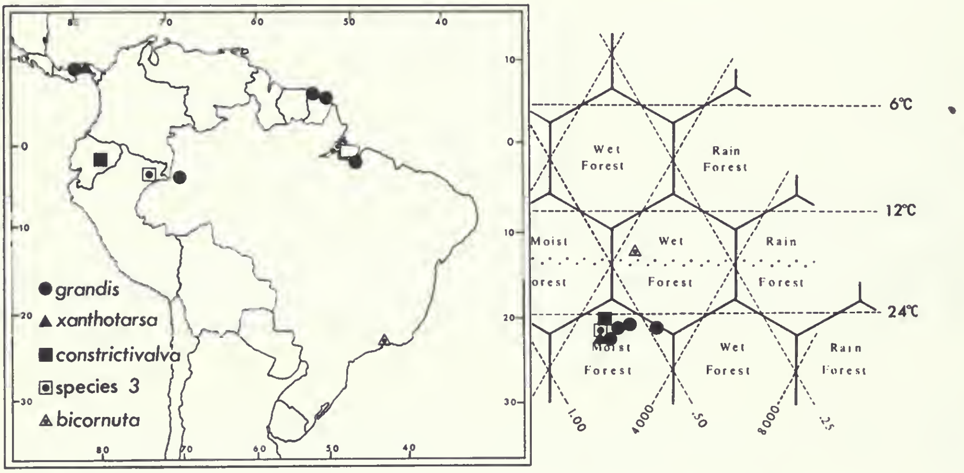


Fig. 32 Geographical and ecological distribution of the *albella*-group of *Timocratica*.

Timocratica xanthotarsa sp. n.

(Figs 32, 70, 106, 107)

♂ 21–22 mm. Frons white, edged with fuscous. Second segment of labial palpus ochreous below, basal two-thirds black above, distal third and internal side white; basal third of third segment white, apical two-thirds black. Antenna white, somewhat tinged with yellow towards apex. Legs golden-yellow above, white below. Fore wing with apex, termen and tornus evenly rounded; all veins free; underside golden-ochreous, slightly tinged with fuscous along apex. Hind wing golden-yellow. Abdomen golden-ochreous, first tergite and sternites white.

Genitalia ♂ (Figs 106, 107). Uncus with lateral margins nearly parallel, apical margin concave. Apex of gnathos long, strongly sclerotized. Digitate processes of juxta tapered towards apex, apex pointed, dorsal side with sparse setae apically. Valva with basal third narrow, distal two-thirds wide, margins evenly rounded; apex acutely rounded. Aedeagus slightly bent ventrad, vesica with strong curved cornutus.

Remarks. *T. xanthotarsa* is easily distinguished from *grandis* and *bicornuta* by its golden-yellow and white legs, and from *constrictivalva* by the unmodified gnathos.

Distribution (Fig. 32). Panama. The type-series was collected in Tropical Moist Forest.

Material examined

2 ♂ (1 ♂ genitalia preparation).

Holotype ♂, **Panama**: Barro Colorado Island, 1–9.v.1964 (*Duckworth*) (NMNH).

Paratype. **Panama**: 1 ♂, Barro Colorado Island, 1–9.v.1964 (*Duckworth*) (NMNH).

Timocratica constrictivalva sp. n.

(Figs 32, 108, 109)

♂ 21 mm. Frons white. Antenna with scape and basal half of flagellum white. Legs golden-yellow above, white below. Fore wing with apex, termen and tornus evenly rounded; veins free; underside golden-yellow, slightly tinged with fuscous along apex. Hind wing golden-yellow. Abdomen golden-ochreous, first tergite and all sternites white.

Genitalia ♂ (Figs 108, 109). Basal two-thirds of uncus narrow, apical third broadened, apex concave. Gnathos with two long, digitate, ventrally directed processes basally; apex triangular, dorsoventrally compressed. Digitate processes of juxta long and narrow, widely separated, with long setae at middle. Basal third of valva strongly constricted, distal two-thirds abruptly rounded. Aedeagus nearly straight, vesica with long, strong, curved cornutus and few smaller spines opposite.

Remarks. *T. constrictivalva* is very similar externally to *xanthotarsa*, but can be easily distinguished by its constricted valvae; from *grandis* and *bicornuta* it can be separated by the absence of fuscous scales on the legs. *Timocratica* species 3 is possibly the female of this species (see below).

The only specimen representing *constrictivalva* is not in very good condition. It lacks the palpi, the right and half of the left antenna, one of each of the mid and hind legs, as well as most of the scales on the thorax and remaining legs. Nevertheless, as the genitalia are so peculiar and distinctive, it cannot be confused with any other species in the genus. It therefore seems justified to name and describe it.

Distribution (Fig. 32.). Ecuador (eastern side of the Andes). The only specimen was collected in Tropical Moist Forest.

Material examined

Holotype ♂, **Ecuador**: Pastaza, Sarayacu (*Buckley*) (BMNH).

Timocratica species 3

(Figs 32, 162)

♀ 18 mm. Externally very similar to *constrictivalva*. Veins CuA_1 and CuA_2 stalked on fore wing.

Genitalia ♀ (Fig. 162). Margin of ostium bursae expanded posteriorly as two lobes. Antrum long, somewhat broadened at middle, with few strong longitudinal wrinkles. Ductus bursae constricted posteriorly, broadening progressively towards corpus bursae. Corpus bursae wide, globular, walls, as in ductus bursae, densely scobinated. Signum a single subrectangular plate weakly sclerotized along middle.

Remarks. The specimen considered here is externally very similar to *constrictivalva* and *xanthotarsa*, and may well represent the female of the former species, but it differs by the stalked veins CuA_1 and CuA_2 of the fore wing.

Distribution (Fig. 32). Peru (eastern side of the Andes). The single specimen was collected in Tropical Moist Forest.

Material examined

Peru: 1 ♀, Loreto, Iquitos (*Strecker*) (NMNH).

Timocratica subovalis (Meyrick)

(Figs 33, 112, 113)

Stenoma subovalis Meyrick, 1932: 304; Busck, 1935: 58 [catalogue]. Holotype ♂, Brazil (NMNH) [examined].

Stenoma stomatocosma Meyrick, 1932: 304. Holotype ♂, Brazil: (NMNH) [examined]. **Syn. n.**
Timocratica stomatocosma (Meyrick) Busck, 1935: 17 [catalogue].
Timocratica subovalis (Meyrick) Duckworth, 1962: 113.

♂ 16–17 mm. Frons white, edged with fuscous. Second segment of labial palpus golden-ochreous below, basal half dark fuscous above, white internally and at distal articulation; third segment white with fuscous scales towards apex. Antenna ochreous with fuscous scales, scape white. Fore coxa golden-yellow below, tibia and tarsus dark fuscous; mid and hind tarsi golden-yellow. Fore wing with costa evenly rounded, apex rounded, somewhat angled, termen and tornus evenly rounded; veins free; underside of both wings golden-yellow above cell. Hind wing white above. Abdomen golden-ochreous, first tergite, anal tuft and sternites white.

Genitalia ♂ (Figs 112, 113). Uncus slightly broadened basally or with lateral margins nearly parallel; apex strongly concave, nearly bifurcate. Apex of gnathos short, pointed. Digitate processes of juxta well separated basally; distal half progressively pointed, covered with long setae dorsally. Valva wide, dorsal margin straight, ventral margin evenly rounded. Aedeagus bent ventrad, vesica with long, strong, bent cornutus and many smaller, pointed spines opposite.

Remarks. *T. subovalis* is the only species with a golden-ochreous abdomen and white hind wings that has the mid and hind tarsi golden-yellow.

The holotype of *stomatocosma* is an anomalous specimen in which M_3 and CuA_1 are shortly stalked in the right fore wing and stalked from the middle in the left. Meyrick considered it a distinct species, probably because of this feature; since both holotypes agree in all other details, including genitalia, they are considered here to be conspecific.

Distribution (Fig. 33). Brazil (Amazon Basin). The two type-localities belong to the same Life Zone, Tropical Moist Forest.

Material examined

Brazil: holotype ♂ of *S. subovalis*, Amazonas, Ponte Nova, Rio Xingu (NMNH); holotype ♂ of *S. stomatocosma*, Tefé, ix (*Fassal*) (NMNH).

Timocratica species 4

(Figs 33, 177)

♀ 17 mm. Head white. Second segment of labial palpus white, basal half dark fuscous above; third segment white, progressively fuscous towards apex. Legs white; fore coxa and femur golden-yellow above, tibia and tarsus dark fuscous below; mid and hind tarsus golden-yellow below. Fore wing with costa evenly rounded, apex angled, termen and tornus obliquely rounded; R_4 and R_5 connate basally, CuA_1 and CuA_2 stalked at basal fourth; underside golden-yellow, slightly tinged with fuscous along apex. Hind wing slightly tinged with golden-yellow above, deeper towards apex, underside golden-yellow above cell and along termen. Abdomen golden-ochreous, first tergite, anal tuft and sternites white.

Genitalia ♀ (Fig. 177). Margin of ostium bursae slightly concave at middle. Antrum straight, nearly cylindrical. Ductus bursae nearly cylindrical, posterior third thickened, wrinkled, strongly scobinate; anterior two-thirds wrinkled longitudinally. Corpus bursae globular. Signum an irregular, strongly concave plate.

Remarks. The specimen described here is the only one that combines an ochreous abdomen and golden-yellow hind wings with fore tarsi which are white above.

Distribution (Fig. 33). Brazil (Amazon Basin): in Tropical Moist Forest.

Material examined

Brazil: 1 ♀, Pará, Belém ('Pará') (*Moss*) (BMNH).

Timocratica amseli Duckworth **sp. rev.**

(Figs 33, 116, 117, 179)

Timocratica? albella Amsel, 1956: 306, pl. 63, fig. 6, pl. 107, fig. 8. Holotype ♂, Venezuela (ZSBS) [examined]. [Junior secondary homonym of *Depressaria* (*Volucra*) *albella* Zeller, 1839.]
Timocratica amseli Duckworth, 1962: 113. [Objective replacement name for *Timocratica? albella* Amsel, 1956.]
[*Timocratica xanthosoma* (Dognin); Duckworth, 1966: 197 (partim). Misidentification.]

♂ 13 mm, ♀ 17 mm. Head white. Basal two-thirds of labial palpus ochreous externally, basal half dark fuscous above, distal third and internally white; third segment white basally, progressively fuscous towards apex. Fore coxa golden-yellow below, femur and basal two-thirds of tibia golden-ochreous above, distal third of tibia and tarsus dark fuscous; mid tarsus tinged with ochreous below. Fore wing with basal third of costa gently arched, distal two-thirds nearly straight; apex rounded, somewhat angled; termen and tornus obliquely rounded; veins free; basal third of costa tinged with golden-yellow below. Hind wing white. Abdomen golden-ochreous above, first tergite and sternites white.

GENITALIA ♂ (Figs 116, 117). Uncus somewhat broadened at middle. Apex of gnathos narrow, nearly pointed. Digitate processes of juxta very long, compressed laterally at base, distal half with several long setae dorsally. Margins of valva parallel, evenly rounded. Aedeagus strongly bent ventrad at basal third, vesica with strong cornutus.

GENITALIA ♀ (Fig. 179). Margin of ostium bursae slightly concave at middle. Antrum wide, anterior half narrowing progressively towards ductus bursae, strongly wrinkled. Ductus bursae widening progressively towards corpus bursae. Corpus bursae pear-shaped. Signum an irregular, sclerotized plate, concave across middle.

REMARKS. *T. amseli* is easily distinguished from *xanthosoma* by its white fore wing costa, and from *fuscipalpalis* by the ochreous tinge on the second segment of the labial palpus (almost dark fuscous in *fuscipalpalis*).

Duckworth (1966: 197) synonymized this species with *xanthosoma*, but my examination of the types of both species has shown them to be distinct; this is supported by their different ecological distribution.

DISTRIBUTION (Fig. 33). Northern Venezuela, in Tropical Dry Forest.

MATERIAL EXAMINED

1 ♂, 1 ♀ (1 ♂, 1 ♀ genitalia preparation).

Venezuela: holotype ♂, Distrito Federal, Caracas, Los Venados, vi–viii. 1937 (*Vogl*) (ZSBS); 1 ♀ paratype; Distrito Federal, Caracas, Berg Avila, 1000 m, vi–vii (*Vogl*) (ZSBS).

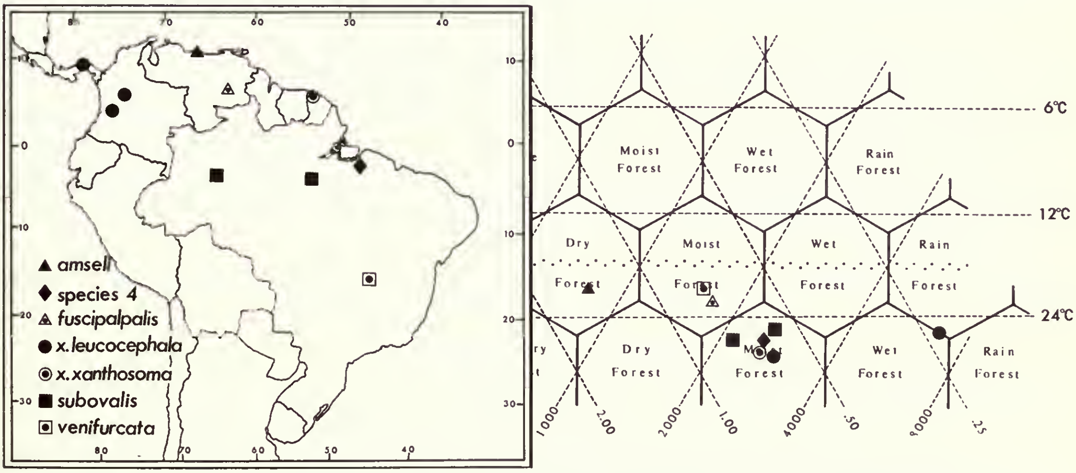


Fig. 33 Geographical and ecological distribution of the *albella*-group of *Timocratica*.

Timocratica venifurcata sp. n.

(Figs 21, 33, 78, 120, 121)

♂ 16–17 mm. Head white. Second segment of labial palpus white, basal two-thirds dark grey externally; third segment white, with grey scales near apex. Legs white, distal half of fore tibia, and tarsi dark fuscous below. Fore wing with costa gently arched, apex rounded, termen and tornus obliquely rounded; R_4 and R_5, and CuA_1 and CuA_2, stalked; basal half of costa with fuscous and golden-yellow scales below. Hind wing white. Abdomen golden-ochreous, first tergite, anal tuft and sternites white.

GENITALIA ♂ (Figs 120, 121). Uncus wide, lateral margins nearly parallel, apex bifurcate. Apex of gnathos narrow, pointed. Digitate processes of juxta flat, triangular, distal half with long sparse setae. Valva with basal half wide, narrowing progressively towards apex. Aedeagus bent ventrad, vesica with strong, short cornutus and many smaller spines opposite.

REMARKS. *T. venifurcata* is the only white species which has an ochreous abdomen and R_4 and R_5 stalked on the fore wings (Fig. 21). It can be easily distinguished from all others with an ochreous abdomen by the lack of ochreous coloration on its palpi and legs.

DISTRIBUTION (Fig. 33). Brazil (Central Plateau), in Tropical Premontane Moist Forest.

MATERIAL EXAMINED

2 ♂ (1 ♂ genitalia preparation).

Holotype ♂, **Brazil**: Distrito Federal, Planaltina, 1000 m, 9.xi.1977 (*Becker*) (MN).

Paratype. **Brazil**: 1 ♂, Distrito Federal, Planaltina, 1000 m, 11.xi.1976 (*Becker*) (BMNH).

Timocratica fuscipalpalis sp. n.

(Figs 33, 114, 115)

♂ 12 mm. Frons white, edged with fuscous. Second segment of labial palpus dark fuscous, tinged with ochreous basally below, white internally and at distal articulation; third segment white, fuscous internally. Antenna light ochreous, scape white. Fore coxa tinged with golden-yellow below; mid and hind legs white. Fore wing with basal third of costa gently arched, apex rounded, termen straight, tornus rounded; veins free; costa golden-yellow below. Hind wing white. Abdomen golden-ochreous above, first tergite and sternites white.

GENITALIA ♂ (Figs 114, 115). Lateral margins of uncus nearly parallel, apex strongly concave, nearly bifurcate. Apex of gnathos broad, rounded. Digitate processes of juxta very long, external margins nearly straight, distal half of internal margins sinuate, distal two-thirds with sparse, irregular row of setae. Dorsal margin of valva straight, ventral margin with basal third sinuate, middle third parallel to dorsal margin, distal third converging progressively towards apex; apex acute. Aedeagus bent ventrad, vesica with single, strong, bent cornutus.

REMARKS. *T. fuscipalpalis* is very close to *amseli* but is easily distinguished by the almost dark fuscous second segment of the labial palpi. It can also easily be distinguished from *venifurcata* by the free veins on the fore wing, from *subovalis* by the plain white hind wings, and from *xanthosoma* by the white costa.

DISTRIBUTION (Fig. 33). Southern Venezuela, in Tropical Premontane Moist Forest, a Life Zone not shared by its closest relatives, *amseli* and *xanthosoma*.

MATERIAL EXAMINED

Holotype ♂, **Venezuela**: Bolivar, Guayaraca, Auyan Tepui, 1100 m, 14.iv.1956 (*Fernandez & Rosales*) (NMNH).

Timocratica xanthosoma (Dognin)

Stenoma xanthosoma Dognin, 1913: 416.

Timocratica xanthosoma (Dognin) Duckworth, 1966: 197 (partim) [synonymy].

♂ 10–17 mm, ♀ 13–18 mm. Frons white, edged with golden-yellow; vertex golden-yellow or white. Second segment of labial palpus white, basal third dark grey above; third segment white with dark grey scales. Antenna white with dark fuscous scales. Legs white; fore coxa golden-yellow below; fore tibia, fore and mid tarsi dark fuscous with white scales. Fore wing with base of costa arched, distal two-thirds nearly straight, apex rounded, termen and tornus obliquely rounded; veins free or CuA_1 and CuA_2 stalked; basal third of costa dark fuscous or black; white below. Hind wing white. Abdomen golden-ochreous, first tergite and sternites white.

GENITALIA ♂ (Figs 118, 119). Uncus narrow, lateral margins nearly parallel, apex concave. Apex of gnathos long, narrow. Digitate processes of juxta with lateral margins nearly parallel, apex with few short setae dorsally. Valva narrow, somewhat broadened basally or with margins nearly parallel. Aedeagus slightly bent ventrad, ventral side of apex with two lateral, pointed projections; vesica with single, long, curved cornutus.

GENITALIA ♀ (Fig. 176). Margin of ostium bursae expanded posteriorly, strongly concave at middle. Antrum wide, wrinkled anteriorly. Ductus bursae cylindrical, expanded progressively towards corpus bursae. Corpus bursae reniform. Signum a transverse, irregular plate, slightly constricted at middle.

REMARKS. *T. xanthosoma* can be easily distinguished from other species with an ochreous abdomen and white hind wings by the dark fuscous or black basal half of its fore wing costa, and from *venifurcata* by the free veins R_4 and R_5.

Duckworth (1966: 197) synonymized *amseli* with *xanthosoma* and added Guatemala, Panama and Colombia to the distribution. After examining his material it was found that *amseli* is a good species and the specimens from Panama represented a subspecies of *xanthosoma*, described below as *leucocephala*. The material from Guatemala was not available for study.

DISTRIBUTION (Fig. 33). Colombia, French Guiana, Panama. Both subspecies appear to be restricted to Tropical Moist Forest and Tropical Wet Forest.

Timocratica xanthosoma xanthosoma (Dognin)

(Figs 33, 176)

Stenoma xanthosoma Dognin, 1913: 416; Meyrick, 1925: 192 [synonymy]; Busck, 1935: 60 [catalogue]. Holotype ♂, FRENCH GUIANA (NMNH) [examined].

Stenoma sacra Meyrick, 1918: 209. Holotype ♀, FRENCH GUIANA (BMNH) [examined]. [Synonymized by Meyrick, 1925: 192.]

Timocratica xanthosoma (Dognin) Clarke, 1955: 392, pl. 196, figs 3–3c [adult, genitalia of holotype of *sacra* Meyrick].

♂ 10–14 mm, ♀ 13–16 mm. Vertex golden yellow.

REMARKS. *T. xanthosoma xanthosoma* has the vertex golden-yellow, whereas in *x. leucocephala* it is white. The nominate subspecies is also smaller on average than the latter, and the white scales on the palpi, tarsi and antennae predominate over the black, making these appendages look lighter.

DISTRIBUTION (Fig. 33). French Guiana.

MATERIAL STUDIED
5 ♂, 2 ♀ (4 ♂, 2 ♀ genitalia preparations).

French Guiana: holotype ♂ of *S. xanthosoma*, St Laurent du Maroni (NMNH); holotype ♀ of *S. sacra*, R. Maroni, 1916 (*Le Moult*) (BMNH); 4 ♂, 1 ♀, St Jean du Maroni (*Le Moult*) (BMNH).

***Timocratica xanthosoma leucocephala* subsp. n.**

(Figs 33, 77, 118, 119)

Timocratica xanthosoma (Dognin); Duckworth, 1966: 197 (partim) [synonymy].

♂ 14–17 mm, ♀ 18 mm. Vertex white. Antenna white mixed with black scales. Fore femur, fore and mid tibiae above, and tarsi black, with scattered white scales mainly on the mid and hind tarsi.

REMARKS. *T. xanthosoma leucocephala* is distinguished from the nominate subspecies by the white vertex. It is also larger on average and the black scales on the palpi, antennae and tarsi predominate over the white so that these appendages look darker.

DISTRIBUTION (Fig. 33). Colombia and Panama.

MATERIAL EXAMINED
6 ♂, 1 ♀ (3 ♂, 1 ♀ genitalia preparations).

Holotype ♂, **Panama**: Canal Zone, Barro Colorado Island, 5–10.iv.1965 (*Duckworth*) (NMNH).

Paratypes. **Colombia**: 1 ♂ [Bogota?] (*Nolcken*) (BMNH); 1 ♂, Chocó, Juntas, Rio Sán Juán, 100 m ('400 ft'), ii.1909 (*Palmer*) (BMNH). **Panama**: 3 ♂, 1 ♀, Canal Zone, Barro Colorado Island, 10–28.iv.1964, 5–10.iv.1965 (*Duckworth*) (NMNH).

Timocratica anelaea (Meyrick)

(Figs 34, 71, 122, 123)

Stenoma anelaea Meyrick, 1932: 305. Holotype ♂, BRAZIL (NMNH) [examined].
Timocratica anelaea (Meyrick) Busck, 1935: 16 [catalogue].

♂ 25–26 mm. Frons white, edged with golden-yellow. Second segment of labial palpus ochreous, basal half dark grey above; third segment black. Antenna white. Fore coxa and tibia with dark grey scales above, fore and mid tarsi black. Fore wing elongate, costa gently arched, apex angled, termen and tornus obliquely rounded; veins free; white below. Hind wing white. Abdomen golden-ochreous with white transverse bands on articulations, first tergite, anal tuft and sternites white.

GENITALIA ♂ (Figs 122, 123). Uncus with lateral margins nearly parallel, apex strongly concave. Apex of gnathos broad, triangular. Digitate processes of juxta long, broad basally, narrowing progressively towards apex; apex pointed, distal half with long setae above, few setae on ventral side. Margins of valva evenly rounded, nearly parallel, somewhat convergent from distal third to apex. Aedeagus bent ventrad at base, vesica with strong elongate, bent cornutus and many minute spines.

REMARKS. *T. anelaea* is the only species in the group with an ochreous abdomen transversely banded with white on the articulations.

DISTRIBUTION (Fig. 34). Brazil (Amazon Basin). Both localities are in Tropical Moist Forest.

MATERIAL EXAMINED
3 ♂ (2 ♂ genitalia preparation).
Brazil: holotype ♂, Amazonas, Ponte Nova, Rio Xingu (NMNH); 2 ♂, Pará, Belém ('Pará') (*Moss*) (BMNH).

Timocratica titanoleuca sp. n.

(Figs 34, 73, 124, 125)

♂ 27–28 mm. Frons white, edged with fuscous. Second segment of labial palpus dark fuscous below and externally, white internally and near distal articulation; third segment white basally, dark fuscous towards apex. Antenna white. Fore coxa above, mid and hind tarsi golden-ochreous; fore tibia and tarsus white above, dark fuscous below. Wings below golden-ochreous above cell and on veins, fore wing with costa gently arched; apex angled, somewhat pointed; termen straight, oblique; tornus rounded; veins free. Abdomen white, somewhat tinged with cream above.

GENITALIA ♂ (Figs 124, 125). Uncus with lateral margins nearly parallel, basal third slightly broadened, apex strongly concave. Apex of gnathos narrow, pointed, strongly sclerotized. Digitate processes of juxta broadened basally, narrowing progressively towards apex, distal half with row of long setae dorsally. Ventral margin of valva evenly rounded, dorsal margin nearly straight. Aedeagus slightly bent ventrad at middle, vesica with strong bent cornutus and many spines of different sizes opposite.

REMARKS. *T. titanoleuca* is very similar externally to *macroleuca* and *leucorectis*, but can be easily distinguished by the absence of ochreous colouring on the labial palpi.

DISTRIBUTION (Fig. 34). Peru (eastern side of Andes). Both localities are in Tropical Premontane Wet Forest.

MATERIAL EXAMINED
2 ♂ (2 ♂ genitalia preparations).
Holotype ♂, **Peru**: Puno, La Oroya, R. Inambari, Carabaya, 1000 m ('3100 ft'), ix.1905 (*Ockenden*) (BMNH).
Paratype. **Peru**: 1 ♂, Huánuco, Tingo Maria, 2.xi.1949 (*Allard*) (NMNH).

Timocratica macroleuca (Meyrick)

(Figs 34, 72, 130, 131)

Stenoma macroleuca Meyrick, 1932: 304. Holotype ♂, BOLIVIA (NMNH) [examined].
Timocratica macroleuca (Meyrick) Busck, 1935: 17 [catalogue].

♂ 27–30 mm. Frons white, edged with fuscous. Second segment of labial palpus white, basal half ochreous below, dark grey above; third segment white, with few black scales on apex. Antenna white. Fore coxa and tibia ochreous above; fore tarsus white above, dark fuscous below; mid and hind tarsi golden-ochreous. Fore wing with costa gently arched; apex angled, somewhat pointed; termen straight, oblique; tornus rounded; veins free; underside golden-yellow, deep golden-yellow along costa and veins. Hind wing below golden-yellow along costa and on veins. Abdomen tinged with golden-yellow above, becoming progressively white towards base, white below.

GENITALIA ♂ (Figs 130, 131). Uncus with lateral margins nearly parallel, somewhat broadened at basal two-thirds, apex concave. Apex of gnathos short, strongly sclerotized, rounded. Digitate processes of juxta very long, narrow, distal two-thirds with sparse setae. Margins of valva evenly rounded, nearly parallel. Aedeagus nearly straight, vesica with strong bent cornutus and many spines of different sizes.

REMARKS. *T. macroleuca* is very similar externally to *leucorectis* and *titanoleuca*, but can be easily distinguished from *titanoleuca* by the ochreous tinge of the second segment of its labial palpi and from *leucorectis* by the fore tarsi, which are white above.

DISTRIBUTION (Fig. 34). Bolivia (eastern slopes of the Andes). The type-locality is in Subtropical Moist Forest, transitional to Tropical Premontane Moist Forest.

MATERIAL EXAMINED
2 ♂ (2 ♂ genitalia preparation).
Bolivia: holotype ♂, La Paz, Rio Songo (*Fassl*) (NMNH); 1 ♂, La Paz, Rio Songo, 750 m (*Fassl*) (BMNH).

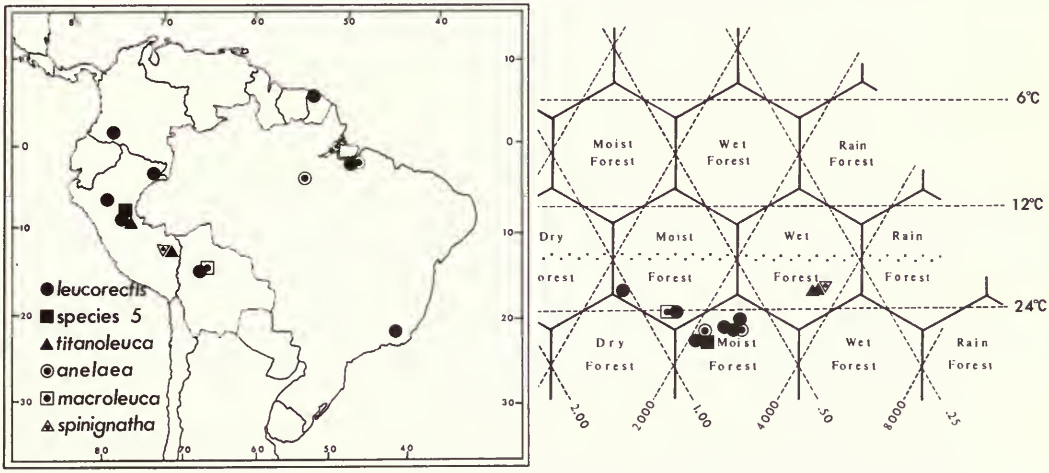


Fig. 34 Geographical and ecological distribution of the *albella*-group of *Timocratica*.

Timocratica leucorectis (Meyrick)

(Figs 34, 126, 127, 164)

Stenoma leucorectis Meyrick, 1925: 223. Lectotype ♂, BRAZIL (BMNH), designated by Clarke (1955: 388) [examined].
Timocratica leucorectis (Meyrick) Busck, 1935: 17 [catalogue]; Clarke, 1955: 388, pl. 194, figs 4, 4b [adult, genitalia].

♂ 28–30 mm, ♀ 30–32 mm. Frons white, edged with fuscous in some specimens. Second segment of labial palpus ochreous below, basal half dark grey above, distal half white above and internally; third segment progressively black from basal third to apex. Antenna white. Distal half of fore tibia above, and fore tarsus dark fuscous, mid and hind tarsi golden-yellow. Fore wing with costa gently arched, apex angled, somewhat pointed; termen straight, oblique; tornus rounded; veins free; underside of wings above cell golden-yellow, some specimens tinged with fuscous along apex and termen. Abdomen white.

GENITALIA ♂ (Figs 126, 127). Uncus with lateral margins nearly parallel, slightly constricted at basal third, apex strongly concave. Gnathos very long, lateral arms nearly parallel from basal third towards apex, two digitate posteriorly directed processes at basal third; apex rounded, strongly sclerotized. Digitate processes of juxta very long; distal half somewhat bent outwards, with long setae. Margins of valva nearly parallel, distal half of ventral margin evenly rounded. Aedeagus curved ventrad, vesica with strong cornutus and several spines.

Genitalia ♀ (Fig. 164). Lamella antevaginalis as two broad, triangular lobes. Ostium bursae wide, margin nearly straight. Antrum bent at middle, anterior half with a few longitudinal wrinkles. Ductus bursae twisted posteriorly, wrinkled longitudinally. Corpus bursae nearly globular, walls, as in ductus bursae, densely scobinate. Signum a nearly circular, diffuse plate.

Remarks. *T. leucorectis* is one of the largest species in the group, and very similar externally to *titanoleuca* and *macroleuca*. It can be easily distinguished from the former by the ochreous underside of the labial palpi and from the latter by the fuscous fore tarsi. The base of the gnathos arms is modified as in *spinignatha* and *constrictivalva* but in *leucorectis* the digitate processes are directed posteriorly.

Distribution (Fig. 34). Brazil, Bolivia, Colombia, French Guiana and Peru. Despite its wide geographic distribution this species appears to be confined to only two Life Zones, Subtropical Moist Forest and Tropical Moist Forest.

Material examined
7 ♂, 2 ♀ (4 ♂, 1 ♀ genitalia preparations).

Bolivia: 2 ♂, La Paz, Rio Songo (*Fassl*) (BMNH). **Brazil**: lectotype ♂, Minas Gerais, Leopoldina, 1924 (BMNH); 1 ♂ paralectotype, Pará, Belém ('Pará'), vii.1919 (*Parish*) (NMNH). **Colombia**: 1 ♂, Putumayo, Mocoa (*Hopp*) (MNHU). **French Guiana**: 1 ♂, Guyanne, Maroni River, 60 m, viii.1904 (*Schaus*) (NMNH). **Peru**: 1 ♂, Sán Martin, Moyobamba (*de Mathan*) (BMNH); 1 ♀, Loreto, Pebas (*de Mathan*) (BMNH); 1 ♀, Sán Martin, Huállaga, Chambirayacu (*de Mathan*) (BMNH).

Timocratica spinignatha sp. n.

(Figs 34, 128, 129)

♂ 19–23 mm. Frons white, edged with fuscous. Second segment of labial palpus ochreous below, dark fuscous above except distal quarter, distal quarter white above; third segment white, apical third dark fuscous. Fore coxa golden-yellow, femora ochreous, basal half dark fuscous above; tarsus and distal half of tibia dark fuscous; mid femur and tibia tinged externally with golden-ochreous, mid and hind tarsi golden-ochreous. Fore wing with costa gently arched, apex angled, termen and tornus rounded; veins free; underside golden-ochreous above cell and on veins, tinged with fuscous along apex and termen. Hind wing golden-ochreous below above cell and on veins. Abdomen tinged with cream above, white below.

Genitalia ♂ (Figs 128, 129). Uncus constricted at middle, apex bifurcate. Gnathos arms expanded ventrad at base, densely covered with minute spines, apex short, rounded. Digitate processes of juxta long, slender, lateral margins nearly parallel, with sparse long setae, mainly along dorsal side. Valva with dorsal margin straight except at base, ventral margin evenly rounded. Aedeagus bent ventrad at basal third, vesica with bent cornutus and many spines of different sizes.

Remarks. *T. spinignatha* is similar externally to *leucorectis*, *macroleuca* and *titanoleuca* but is smaller. It differs externally from *macroleuca* and *titanoleuca* by the dark fuscous fore tarsi and from *leucorectis* by the dark fuscous tinge on the fore femora. The modified gnathos makes the male genitalia very distinctive.

Distribution (Fig. 34). Peru. The type-series was collected in Tropical Premontane Wet Forest.

Material examined
4 ♂ (2 ♂ genitalia preparations).

Holotype ♂, **Peru**: Puno, La Oroya, R. Inambari, 1000 m ('3100 ft'), iii.1905 (*Ockenden*) (BMNH).

Paratypes. **Peru**: 3 ♂, Puno, La Oroya, R. Inambari, 1000 m ('3100 ft'), iii.1905 (*Ockenden*) (BMNH).

Timocratica species 5

(Figs 34, 163)

♀ 17 mm. Frons white, edged with fuscous. Second segment of labial palpus golden-yellow, basal half tinged with dark fuscous above; third segment fuscous internally, white externally. Fore femur golden-yellow;

basal half of fore tibia ochreous above, distal half, and tarsus dark fuscous; mid leg and hind tarsus tinged with golden-yellow. Fore wing with costa evenly arched; apex, termen and tornus rounded; veins free; underside golden-yellow above cell, tinged with fuscous along apex and termen. Hind wing white, underside golden-yellow above cell. Abdomen white.

GENITALIA ♀ (Fig. 163). Lamella antevaginalis expanded posteriorly as two lobes. Antrum very broad posteriorly, anterior half funnel-shaped, wrinkled longitudinally. Ductus bursae broadening progressively towards corpus bursae. Corpus bursae pear-shaped. Signum an irregular plate, strongly constricted at middle.

REMARKS. This species is very similar externally to *spinignatha*, but is smaller and lacks the fuscous tinge on the fore femora.

DISTRIBUTION (Fig. 34). Peru (eastern side of the Andes), in Tropical Moist Forest.

MATERIAL EXAMINED

Peru: 1 ♀, Sán Martin, Tarapoto (*de Mathan*) (BMNH).

Timocratica argonais (Meyrick)

(Figs 35, 132, 133, 170)

Stenoma argonais Meyrick, 1925: 224. Holotype ♀, BRAZIL (BMNH) [examined].
[*Stenoma maturescens* Meyrick, 1925: 223 (partim). Misidentification.]
Timocratica argonais (Meyrick) Busck, 1935: 16 [catalogue].
Timocratica argonias: Clarke, 1955: 387, pl. 193, figs 1–1c. [Incorrect subsequent spelling.]

♂ 20–23 mm, ♀ 20–25 mm. Head white, frons edged with fuscous. Second segment of labial palpus ochreous below, basal two-thirds dark grey above, distal third above and internally white; distal half of third segment progressively fuscous towards apex. Fore coxa and femur above, and tarsus dark fuscous; mid coxa and femur tinged with golden-ochreous externally, tarsus ochreous; hind tibia tinged with golden-yellow externally, tarsus golden-yellow. Fore wing with costa gently arched, apex rounded, somewhat angled; termen and tornus obliquely rounded; veins free; golden-ochreous below, slightly tinged with fuscous along apex and termen. Hind wing golden-yellow above cell. Abdomen white.

GENITALIA ♂ (Figs 132, 133). Uncus with lateral margins nearly parallel, apex strongly concave. Apex of gnathos long and narrow. Digitate processes of juxta broadened basally, narrowing progressively towards apex, distal half with sparse setae above. Ventral margin of valva evenly rounded, dorsal margin straight except at base. Aedeagus somewhat curved ventrad, vesica with strong, curved cornutus and many acutely pointed spines of different sizes.

GENITALIA ♀ (Fig. 170). Margin of ostium bursae straight. Antrum long with some longitudinal wrinkles, strongly bent at connection with ductus bursae. Ductus bursae broadening progressively towards corpus bursae, walls slightly wrinkled. Corpus bursae oblong, walls plain and smooth. Signum an elongate plate weakly sclerotized and smooth along middle.

REMARKS. *T. argonais* is very similar externally to *maturescens*, *megaleuca* and *palpalis*. However, it can be easily distinguished externally from the first by the white inner surface of the labial palpus, and from the others by the fuscous tinge along the apex and termen on the underside of the fore wing. The large series from French Guiana and Guyana agrees well with the lectotype of *argonais* but their conspecificity should be confirmed by males from the type-locality.

DISTRIBUTION (Fig. 35). Brazil, French Guiana and Guyana. All the known localities of this species are in Tropical Moist Forest.

MATERIAL EXAMINED

37 ♂, 15 ♀ (2 ♂, 4 ♀ genitalia preparations).

Brazil: holotype ♀, Amazonas, Fonte Boa, ii.1920 (*Parish*) (BMNH); 1 ♀, Amazonas, Fonte Boa, vii.1906 (*Klages*) (BMNH). **French Guiana**: 6 ♂, 1 ♀ (paralectotypes of *S. maturescens*), R. Maroni (*Le Moult*) (BMNH; NMNH); 29 ♂, 10 ♀, Nouveaux Chantier, i–x (*Le Moult*) (BMNH); 1 ♂, St Jean du Maroni (*Le Moult*) (BMNH). **Guiana**: 1 ♀, Berbice, New River, 250 m ('750 ft'), 20.i–23.iii.1938 (*Hudson*) (BMNH).

Timocratica maturescens (Meyrick)

(Figs 35, 134, 135)

Stenoma maturescens Meyrick, 1925: 223. Lectotype ♂, French Guiana (BMNH), designated by Clarke (1955: 391) [examined].
Timocratica maturescens (Meyrick) Busck, 1935: 17 [catalogue]; Clarke, 1955: 391, pl. 195, figs 1–1b [adult, genitalia].

♂ ♀ 20–22 mm. Head white, frons edged with fuscous. Second segment of labial palpus ochreous, basal third tinged with dark grey above; third segment white with some fuscous scales on apex. Fore coxa and femur above, and tarsus dark fuscous; fore coxa and femur below, and mid and hind tarsi ochreous. Fore wing with costa gently arched, apex angled, termen and tornus rounded; veins free; underside ochreous above cell, white or tinged with fuscous along apex and termen. Hind wing underside ochreous above cell. Abdomen white.

Genitalia ♂ (Figs 134, 135). Uncus with lateral margins nearly parallel, slightly broader basally, apex strongly concave. Apex of gnathos broad, rounded. Digitate processes of juxta long, lateral margins nearly parallel, with sparse long setae mainly along dorsal distal two-thirds. Ventral margin of valva evenly rounded, dorsal margin nearly straight. Aedeagus nearly straight, vesica with strong, curved cornutus and many acutely pointed spines of different sizes.

Remarks. *T. maturescens* is very similar externally to *argonais* and *palpalis* but can be easily distinguished by the lack of white on the second segment of the labial palpus. Meyrick described this species from a series of 10 specimens, of which only nine were traced, eight in the BMNH and one in the NMNH. Only one paralectotype is conspecific with the lectotype of *maturescens*; the other seven belong to *argonais*.

Distribution (Fig. 35). French Guiana, Colombia and Venezuela, in Tropical Moist Forest and Tropical Premontane Wet Forest.

Material examined
7 ♂, 1 ♀ (3 ♂, 1 ♀ genitalia preparations).

French Guiana: lectotype ♂, R. Maroni, 1916 (*Le Moult*) (BMNH); 1 ♂ paralectotype, R. Maroni (*Le Moult*) (BMNH); 1 ♂, St Laurent, R. Maroni, 16.xi.1906 (*Le Moult*) (BMNH). **Colombia**: 2 ♂, Cundinamarca, Medina (*Fassl*) (BMNH); 1 ♂, Guainia, Rio Negro ('Ost Colomb.'), 800 m (*Fassl*) (BMNH). **Venezuela**: 1 ♀, Amazonas, Sán Carlos de Rio Negro, 125 m, 19–31.viii.1976 (*Salcedo & Fernández*) (UCV); 1 ♂, Bolívar, Rio Guaniamo, 160 m, 25–28.v.1979 (*Clavijo, Chacón & Fernández*) (UCV).

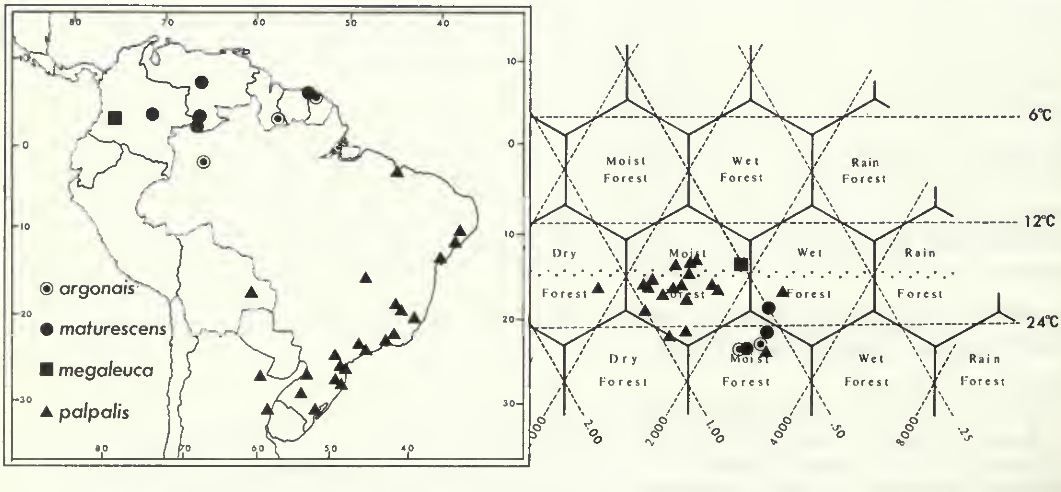


Fig. 35 Geographical and ecological distribution of the *albella*-group of *Timocratica*.

Timocratica megaleuca (Meyrick)

(Figs 35, 169)

Stenoma megaleuca Meyrick, 1912: 711; 1925: 224 [remarks]. Holotype ♀, COLOMBIA (BMNH) [examined].
Timocratica megaleuca (Meyrick) Busck, 1935: 17 [catalogue]; Clarke, 1955: 391, pl. 195, figs 2–2b, 4a [adult, genitalia].

♀ 25 mm. Frons white, edged with fuscous. Second segment of labial palpus ochreous externally, basal half dark grey above, white internally; third segment white, distal half black. Thorax light fuscous above, except tegulae. Fore coxa above, distal half of tibia and fore tarsus dark fuscous; mid and hind tarsi ochreous. Fore wing with costa gently arched, apex angled, termen and tornus obliquely rounded; veins free; ochreous below, except along apex, termen and below cell. Hind wing white.

GENITALIA ♀ (Fig. 169). Margin of ostium bursae slightly expanded posteriorly as two small lobes. Antrum bent dorsally, posterior third cylindrical, anterior two-thirds narrowing progressively towards ductus bursae. Ductus bursae widening progressively towards corpus bursae. Corpus bursae pear-shaped, walls slightly wrinkled longitudinally as in ductus bursae. Signum an elliptical plate without spines along middle.

REMARKS. *T. megaleuca* is extremely similar to *palpalis* and possibly synonymous, as suggested by their ecological distribution. The genitalia of the only known specimen, the female holotype, differ very slightly from those of *palpalis*. However, as no males are available and, as the geographic distribution does not agree with that of *palpalis*, it seems preferable to retain it as a distinct species.

Meyrick (1925: 224), commenting upon his original description stated, "Thorax and abdomen of original type (still unique) described as white (I supposed them to be discoloured); actually the thorax is tinged greyish-ochreous except patagia, abdomen suffused pale greyish-ochreous becoming greyer posteriorly; I now think this colouring may be natural, but am not certain; there is nothing of the sort in any of the allied species. Otherwise the species is nearest *auxoleuca* [*palpalis*]."

DISTRIBUTION (Fig. 35). Colombia (known only from the type-locality), in Tropical Lower Montane Moist Forest.

MATERIAL EXAMINED
Colombia: holotype ♀, Cauca, Popayán, 1906 (*L.*) (BMNH).

Timocratica palpalis (Zeller)

(Figs 4, 7, 13, 35–45, 136, 137, 168)

Cryptolechia (*Cryptolechia*) *palpalis* Zeller, 1877: 275. Holotype ♂, BRAZIL (MNHU) [examined].
Stenoma auxoleuca Meyrick, 1925: 223. Lectotype ♂, BRAZIL (BMNH), designated by Clarke, 1955: 387 [examined]. [Synonymized by Meyrick, 1926: 239.]
Timocratica haywardi Busck, 1938: 280, figs 1–2. Holotype ♂, ARGENTINA: Entre Rios, Concordia (*Hayward*) (NMNH) [not examined]. **Syn. n.**
Stenoma palpalis (Zeller) Meyrick, 1926: 239 [synonymy, distribution].
[*Timocratica palpalis* (Zeller);] Hempel, 1909: 68 [host, damage]; Ihering, 1909*a*: 228 [host, damage]; 1909*b*: 525 [host, damage].
[*Stenoma albella* (Zeller); Bondar, 1912: 15, figs 1–6, pl. 1 [host, damage, description]; Bondar, 1913: 24, figs 17–20 [host, damage, description]; Lima, 1928: 161 [host]; Andrade, 1928 [host, damage]; Lima, 1930 [cat.]; Santos, 1934: 36 [host, damage]; Barbosa, 1933: 288, fig. 113 [host, damage]; Ronna, 1933: 332 [host, damage]; Fonseca, 1934: 228 [host]; Monte, 1934: 176, figs 161–162 [host, damage]; Ronna, 1934*a* [host, damage]; 1934*b* [host, damage]; Pyenson, 1938 [host, damage]; Carvalho & Carvalho, 1939: 47 [hosts]; Lima, 1950: 1 [damage, control]; Silva & Heinrich, 1950: 9 [hosts]; Bertels, 1954: 61 [hosts]. Misidentifications.]
[*Timocratica albella* (Zeller); Lima, 1936: 277 [hosts]; Araujo, 1937: 310 [host, control]; Caldeira & Vieira, 1938 [host]; Biezanko & Freitas, 1938: 27 [catalogue, hosts]; Biezanko & Seta, 1939 [hosts]; Costa, 1942: 248 [host, damage]; Lima, 1945: 269 [hosts, damage, description, genitalia]; Lepage & Figueiredo, 1946 [hosts]; Duarte, 1947: 192 [host, damage, control]; Biezanko, Bertoldi & Baucke, 1949 [hosts]; Lofti, 1949: 20 [host, damage, control]; Robbs, 1953: 80 [host]; Costa, 1958: 139 [host, damage]; Robbs, 1960: 91 [host, damage]; Biezanko, 1961*a*: 12 [hosts]; 1961*b*: 6 [host]; Mariconi & Soubihe,

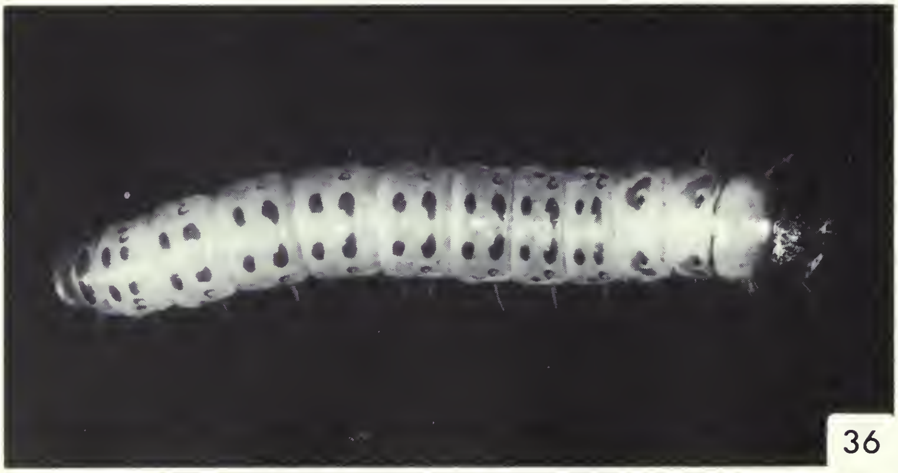
1961: 35 [host, damage]; Maranhão, 1962: 9 [host]; Pinheiro, 1962: 248 [host]; Mariconi, 1963: 389, figs 178C–D [hosts, damage, description, control]; Sefer, 1963: 42 [host]; Silva *et alii*, 1968 [hosts]; Gallo *et alii*, 1970: 570 [hosts, damage]. Misidentifications.]

Timocratica palpalis (Zeller) Busck, 1935: 17 [catalogue].

Timocratica auxoleuca (Meyrick) Clarke, 1955: 387, pl. 193, figs 2–2b [adult, genitalia]; Hayward, 1969: 72 [hosts].

♂ 14–24 mm, ♀ 19–25 mm. Frons white, edged with fuscous. Second segment of labial palpus ochreous below except near distal articulation, basal half dark grey above, white internally and near distal articulation; third segment white, distal half becoming progressively dark grey towards apex. Fore coxa, femur and basal half of tibia ochreous above, femur tinged with dark grey above, distal half of tibia, and tarsus dark greyish-fuscous; mid and hind tarsi ochreous. Fore wing with costa gently arched, apex angled, termen and tornus obliquely rounded; veins free; underside above cell and veins golden-ochreous, except along apex and termen. Hind wing and abdomen white.

GENITALIA ♂ (Figs 136, 137). Uncus with lateral margins parallel or narrowing slightly towards apex, apex concave. Apex of gnathos wide, rounded. Digitate processes of juxta wide basally, narrowing towards apex, distal two-thirds with long setae dorsally. Valva with margins nearly parallel or somewhat broadened at distal third, sacculus slightly pronounced. Aedeagus somewhat bent ventrad, vesica with strong bent cornutus and several smaller spines.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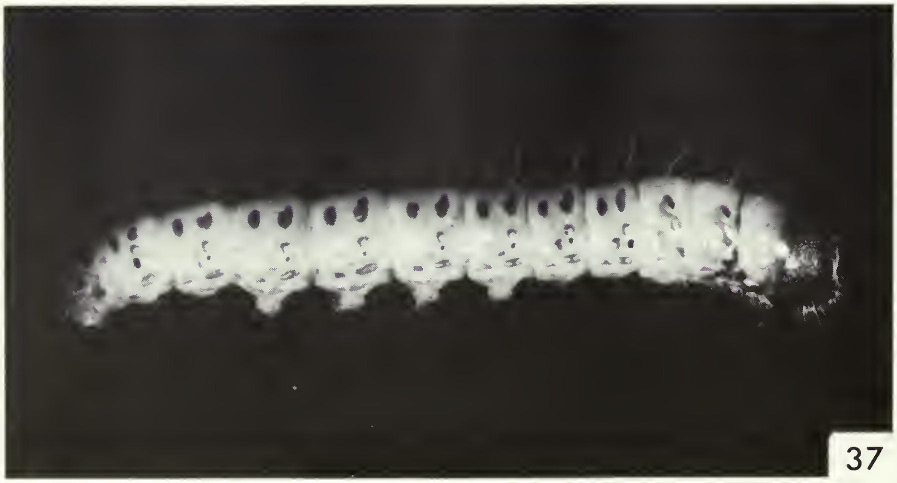
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Figs 36, 37 *Timocratica palpalis* (Zeller), last instar larva, Brazil, Santa Catarina, ex *Psidium guajava*. 36, dorsal view; 37, lateral view.

GENITALIA ♀ (Fig. 168). Margin of ostium bursae slightly concave at middle. Antrum long, posterior third nearly cylindrical, anterior two-thirds narrowing progressively towards ductus bursae, with few longitudinal wrinkles. Ductus bursae widening progressively towards corpus bursae. Corpus bursae pear-shaped, walls strongly wrinkled as in ductus bursae. Signum a long elliptical plate, slightly constricted at middle, without spines in central area.

PUPA. ♂, ♀, length 15–19 mm, maximum diameter 4·5–5·5 mm. Indistinguishable from that of *melanocosta*.

LARVA (Figs 36–42). Maximum length 35 mm; cylindrical, dark pinkish violet; pinacula large, well defined, slightly prominent, dark brown. Anal comb absent. Meso- and metathorax with extra sclerotized area, 'pinacula without setae', between setae L and setae SV1; abdominal segments 1–2 with two extra sclerotized areas, 'pinacula', on each segment, one behind spiracle, between setae SD and setae L, the other behind L1 + L2, above L3; segments 3–7 with three extra sclerotized areas, two as in segments 1–2 and a third in front of L3, above setae SV. Abdominal prolegs with 112–116 crochets in triordinal circle, anal prolegs with 58–62 crochets arranged triordinally in anal penelipse. Head hypognathous, nearly spherical, with irregular, hexagonally sculptured surface, dark brown; adfrontal area not reaching to vertical angle; only primary setae present; mandible with two small blunt teeth; ocellus V below antenna; adfrontal area slightly prominent near clypeus; setae P2 closer to each other than setae P1. Prothoracic plate prominent, strongly sclerotized, dark brown, with irregularly sculptured area behind setae SD2; D1 equidistant to XD1 and D2, below level of former, posterior to second; SD2 between XD2 and SD1, slightly posterior to both; MXD1, MD1 and MSD1 present; L1, L2, L3 on same pinaculum; SV1 and SV2 on same pinaculum; spiracle vertically elongated. Meso- and metathorax with D1, D2, SD1 and SD2 on same pinaculum; D1 slightly posterior to D2; pinaculum L1 + L2 slightly connected with L3; SV1 below L3. Abdomen with spiracle on segment 1 twice the size of others; setae D1 on segments 1–2 slightly closer to each other than setae D2, further apart on 3–7; SD2 on segments 1–8 present but greatly reduced; SV3 absent on segments 1 and 7–9.

REMARKS. *T. palpalis* is easily distinguished from any other species from southern South America, except *isarga*, by the dark fuscous fore tarsi and dark fuscous distal half of fore tibiae. *T. isarga* has similarly coloured tarsi and tibiae but has the fore wings white below, CuA_1 and CuA_2 stalked, and the hind tarsi white. *T. megaleuca* from Colombia is probably also a synonym of *palpalis*, as discussed on p. 253.

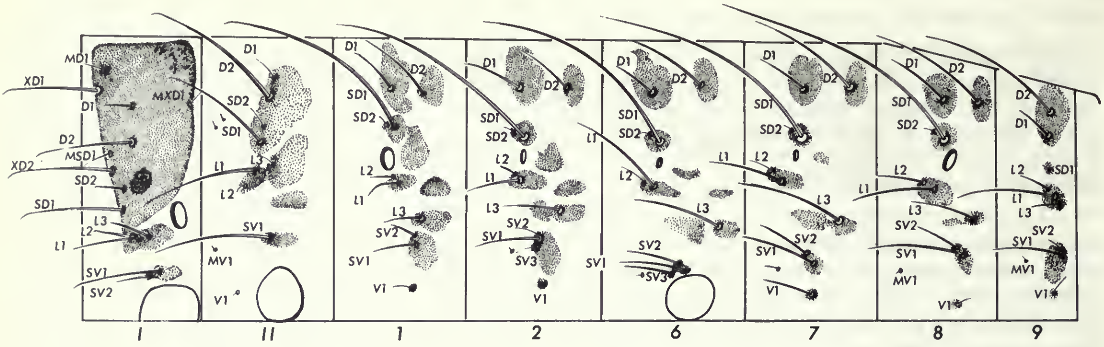
As a large number of specimens were available for study, either collected at light or reared on different hosts and from different places, some variation in size and genitalia was found. Specimens from warmer areas such as the east, the Central Plateau and the coast of Brazil, south to the lowlands of Santa Catarina, are on average larger than those from the Parana Plateau, south Brazil and Argentina. Variation of the male genitalia occurs mainly in the shape of the valva and digitate processes of the juxta. The valva may be slightly narrowed with the margins nearly parallel, or have the distal half somewhat broadened and the sacculus slightly pronounced. In some specimens the digitate processes of the juxta are broad, nearly triangular, with the margins converging progressively towards the apex, whereas in others the distal half is very narrow.

This species, referred to as *albella* (Zeller) in the Brazilian economic literature, is the most common species in the south of South America, mainly in southern Brazil and northern Argentina, and is a pest of ornamental, fruit and timber trees. As the adults are almost white, it was originally identified by Bondar (1912: 15) as *Stenoma albella* (Zeller) and this name has been used by all subsequent authors; at that time *albella* appeared to be the only available name for a large white stenomine, since *grandis* has golden-yellow hind wings, and *palpalis* was still considered an Indian species.

Although the holotype bears the label 'Bengal', there is no doubt that it represents this South American species, as pointed out by Meyrick (1926: 239).

BIOLOGY. The larvae of *T. palpalis* are polyphagous bark-feeders and considered to be pests of ornamental, fruit and timber trees in Brazil and Argentina. They tunnel into the trunk and larger branches of the host-plant, feeding on the bark surrounding the holes (Fig. 43). No branches of less than 2 cm diameter were found infested. The tunnel is shallow, only 5–8 cm long and about 0.5 cm wide when the larva is ready to pupate. The tunnel begins more or less at right angles to the axis of the wood and then follows the pith (Fig. 45). Larvae collected in Brusque, Santa Catarina, were tunnelling the trunk upwards, whereas those collected in Sete Lagoas, Minas Gerais, were tunnelling down towards the base of the tree. In the former locality it rains throughout the year, making it necessary to tunnel upwards to avoid flooding of the hole, whereas in Sete

Lagoas, in the Central Plateau of Brazil, the larvae develop during a well-defined dry season, when there is no such danger. The larvae cover the eaten areas of the bark with frass (Fig. 44), and so remain hidden when feeding outside the tunnel. No larvae were found feeding during the day.


MD1
XD1
MXD1
D1
D2
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SD1
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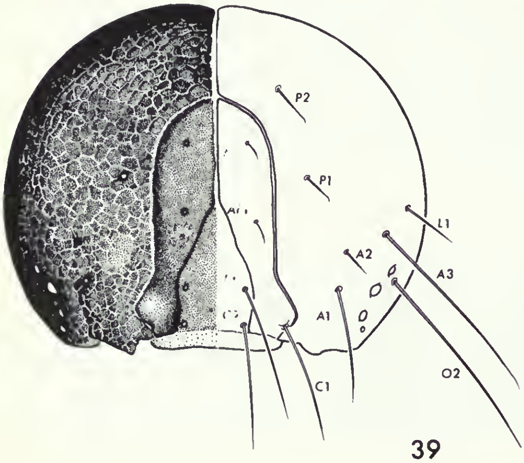
38


P2
P1
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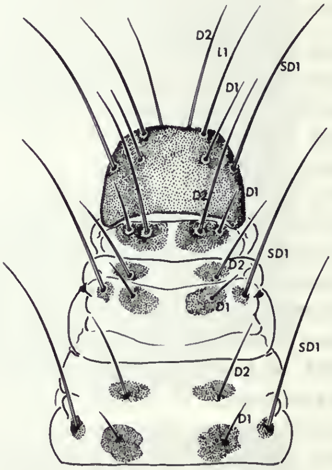
C1
O2

39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L1
SD1
D1
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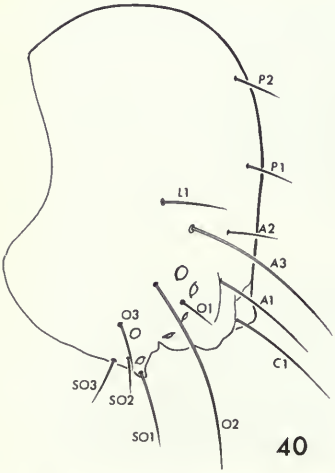
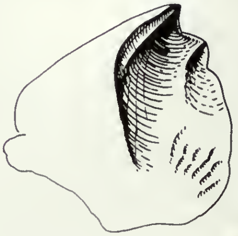
D1
SD1
D2
D1
SD1
D2
D1

41


P2
P1
L1
A2
A3
A1
O1
O3
C1
SO3
SO2
SO1
O2

40



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Figs 38–42 *Timocratica palpalis* (Zeller), last instar larva. 38, setal map. 39, frontal view of head. 40, lateral view of head. 41, dorsal view of last three abdominal segments. 42, inner surface of mandible.

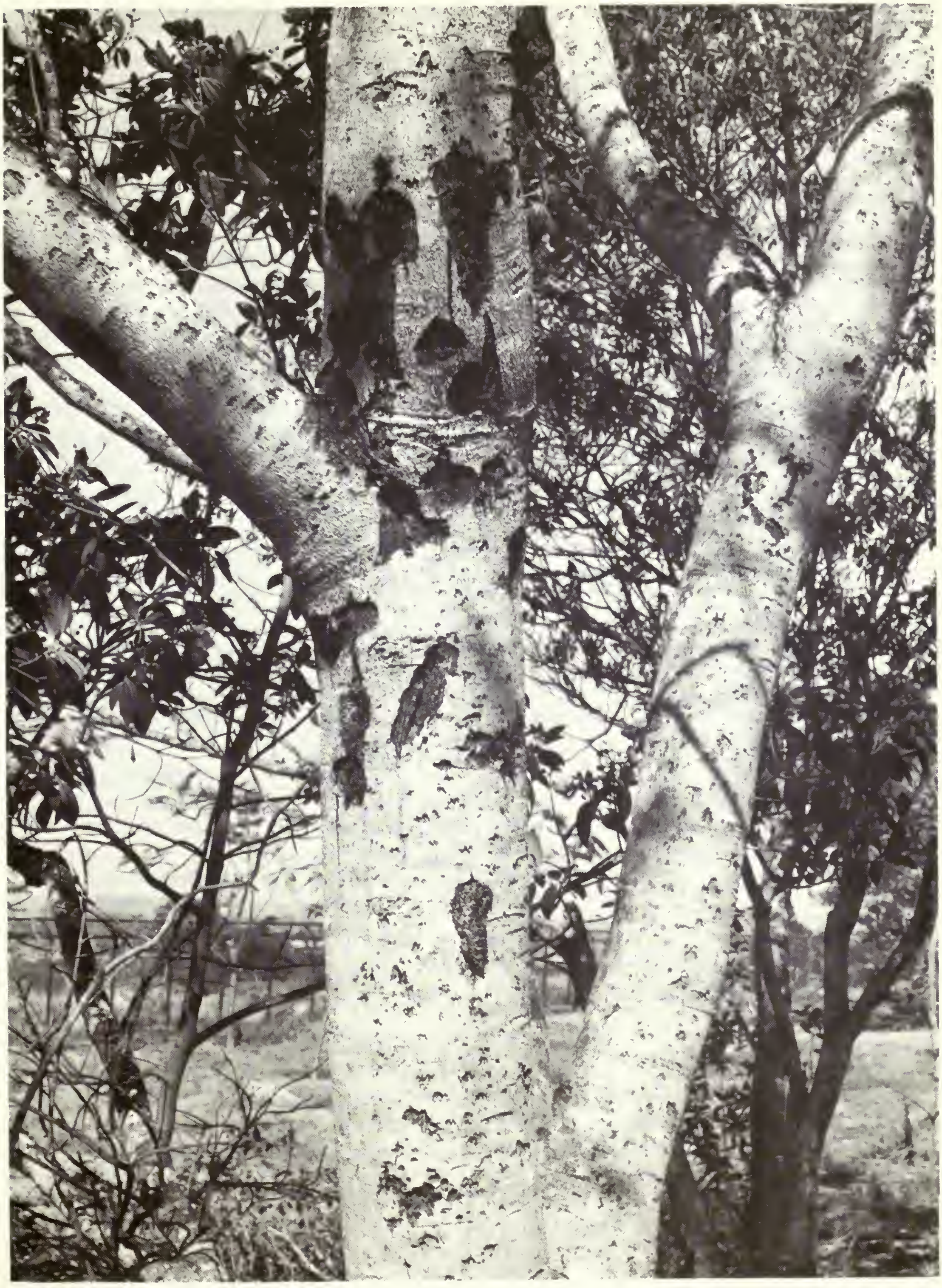


Fig. 43 Damage caused by larvae of *Timocratica palpalis* (Zeller) on the trunk of *Tibouchina candolleiana*.

Pupation takes place inside the tunnel; the pupa is attached by the cremaster to a few strands of silk on the tunnel wall.

Field observations and label data show that there are differences in the flight period of adults, and specimens from warmer areas emerge earlier in the season than those from cooler places. Most specimens from Minas Gerais were collected from early October to late February, those from the lowlands of Santa Catarina, further south, emerged at the beginning of December, specimens from Rio Grande do Sul were collected in January, while those bred by Hayward in Argentina emerged in March. Possibly the species has two generations in warmer localities, but is univoltine further south where the average temperature is lower.

T. palpalis is usually a minor pest, but when infestation is high it may seriously damage the trees (Fig. 43). When the trunk or branch is ring-barked, the tree dies beyond that point. In some Myrtaceae, such as guava (*Psidium guajava* L.), the bark never recovers and the trunk becomes deformed where it was damaged. In Brasilia, strong infestation was found in a number of *Tibouchina candolleiana* (Melastomataceae), an ornamental tree with attractive pink and violet flowers. Some of the trees contained more than 100 larvae. Considering that one larva can seriously damage or even kill a whole branch, such an infestation is very serious.

It seems that the preferred host-plants are Myrtaceae, mainly species of *Psidium*, and it is very easy to find the larvae feeding on guava, a common fruit tree in South America. Table 2 gives a list of the host plants of *palpalis* based on my own observations and the literature.

Table 2 Food plants of *T. palpalis*

Scientific names	English vernacular names	Brazilian vernacular names
ACERACEAE		
Acer saccharinum	Silver maple	
A. platanoides	Norway maple	
CASUARINACEAE		
Casuarina equisetifolia	Casuarina, Willow, Whistling pine	Casuarina
CUNONIACEAE		
Belangera tomentosa		Cangalheiro
EBENACEAE		
Diospyros kaki	Kaki	Caqui
FAGACEAE		
Castanea sativa	Sweet chestnut	Castanheira
Quercus robur	British oak	Carvalho-inglês
LAURACEAE		
Persea america	Avocado pear	Abacateiro
MELASTOMATACEAE		
**Tibouchina candolleiana*		Quaresmeira
**T. urvilleana*		Quaresmeira
MYRTACEAE		
Calycorectes pohlianus		Cambucazeiro
Campomanesia acida		Araçă-do-Pará
Eucalyptus alba	Timor white gum	Eucalipto
E. camaldulensis (= *E. rostrata*)	Murray red gum	Eucalipto
E. citriodora	Lemon scented spotted gum	Eucalipto
E. propinqua		Eucalipto
**E. saligna*	Sydney blue gum, Saligna gum	Eucalipto
E. tereticornis	Forest red gum	Eucalipto

* Author's observations; others were quoted from Araujo *et al.* (1968) and Hayward (1969), and from label data.

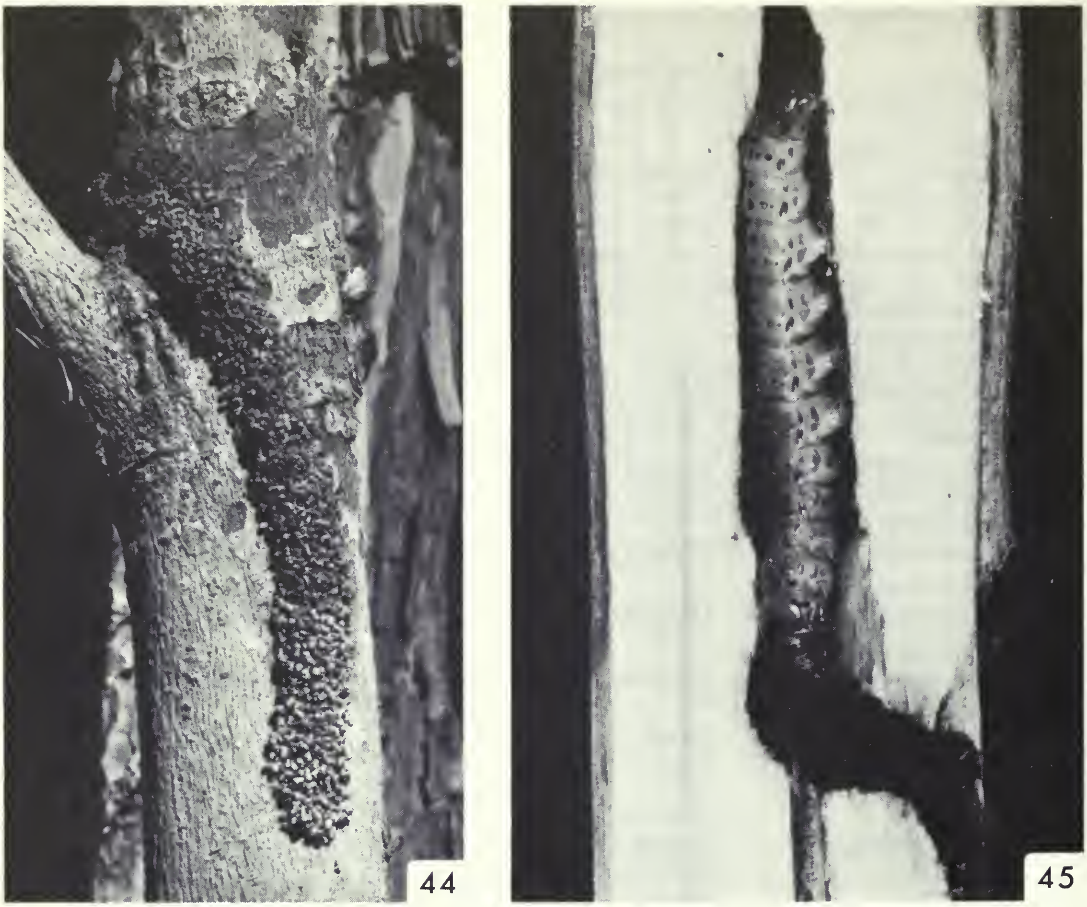
English vernacular names follow Adams (1972) and Bailey (1900–02); Brazilian vernacular names of the Myrtaceae follow Legrand & Klein (1967–78).

Table 2 (*continued*)

Scientific names	English vernacular names	Brazilian vernacular names
Eugenia brasiliensis		Grumixameira
E. uniflora	Surinam cherry	Pitangueira
**E. involucrata*		Cerejeira-de-folha-miúda
Hexachlamys edulis		Cereja-do-Rio Grande
Marlierea tomentosa		Garapuruna
Myrcia fenzliana		Guamirim-araçá
Myrciaria trunciflora		Jaboticabeira
**Psidium guajava*	Guava	Goiabeira
P. guineense	Guiana guava	Araçá-azedo
P. humile		Araçá-vermelho
Syzygium jambos	Rose apple	Jambeiro
S. malaccense	Otaheite apple	Jambeiro-vermelho
PLATANACEAE		
Platanus orientalis	Oriental plane	Plátano-oriental
PROTEACEAE		
Macadamia ternifolia	Queensland nut	Macadamia
PUNICACEAE		
Punica granatum	Pomegranate	Romanzeira
ROSACEAE		
Cydonia vulgaris	Quince	Marmeleiro
Eriobotrya japonica	Loquat	Ameixeira-do-Japão
**Malus domestica*	Apple	Macieira
M. sylvestris	Crab apple	Macieira-silvestre
Prunus amygdalus	Almond	Amendoeira
P. armeniaca	Common apricot	Abricó
P. domestica	Common garden plum	Ameixeira
P. persica	Peach	Pêssego
**Pyrus communis*	Common pear	Pereira
**P. sinensis*	Sand pear, Japanese pear, Chinese pear	Pereira-do-Japão
RUBIACEAE		
Coffea arabica	Arabian coffee	Cafeeiro
SALICACEAE		
Salix viminalis	Osier willow	Vimeiro
TILIACEAE		
Luehea divaricata		Açoita-cavalo
ULMACEAE		
Ulmus americana	White elm	

Sometimes the larvae are heavily parasitized. About 80 per cent of the larvae collected in Brasilia on *Tibouchina candolleiana* were parasitized by an apparently undescribed species of *Eudeleboea* Blanchard (Ichneumonidae). They may also be preyed on by birds. A wild guava (*Psidium* sp.), found near Planaltina, Distrito Federal, at the beginning of September 1978 had branches attacked by three larvae. However, it was found that each larval gallery had a fresh hole near the middle, made by an unidentified species of woodpecker, through which the bird had removed the larva. It is interesting to note that *Psidium* species have a very hard wood and the bird had to make a hole 2 cm deep to reach the larvae.

DISTRIBUTION (Fig. 35). Northern Argentina, Bolivia, Brazil. This species has not only a wide range of food-plant preference and geographical distribution, but also a wide range of ecological



Figs 44–45 Damage caused by larvae of *Timocratica palpalis* (Zeller). 44, branch of *Pyrus communis* with areas partially covered by frass (*O. Mielke* photo). 45, split branch of *Psidium guajava* showing larva inside gallery.

range of food-plant preference and geographical distribution, but also a wide range of ecological distribution. It has been collected from Warm Temperate Dry Forest, in the North Argentina 'Chaco' area, and Warm Temperate Moist Forest of southern Brazil and Argentina, crossing the Subtropical Moist Forest of southern Brazil, up to the Tropical Moist Forest of the north-east Brazilian coast. The high concentration of localities in Warm Temperate and Subtropical Moist Forest Life Zones does not indicate that this species is chiefly associated with these Life Zones, but probably means that the species has been more intensely collected there.

MATERIAL EXAMINED

71 ♂, 31 ♀, 8 larvae, 4 pupae (9 ♂, 5 ♀ genitalia preparations).

Argentina: 5 ♂ paratypes of *T. haywardi*, Entre Rios, Concordia, ex guava [*Psidium guajava* L.], iii.1937 (*Hayward*) (BMNH; NMNH); 1 ♂ paratype of *T. haywardi*, Entre Rios, Concordia, ex pomegranate [*Punica granatum* L.], iii.1938 (*Hayward*) (NMNH): 1 ♂, Santa Fé, Villa Ana, iii.1924 (*Hayward*) (BMNH). **Bolivia**: 1 ♂, Nuflo de Chaves, Esperanza (BMNH). **Brazil**: holotype ♂ of *C. palpalis*, 'Bengal' (MNHU); lectotype ♂ of *S. auxoleuca*, Espirito Santo, Leopoldina, 1924 (BMNH); 1 ♂, no further data (BMNH); 1 ♂, 2 ♀, Alagoas, Maceió ['Maceo'] (BMNH); 1 ♂, 2 ♀, Bahia, Salvador (*Fruhstorfer*) (BMNH); 3 ♂, Distrito Federal, Brasilia, 10.x.1979 (*Gomes*) (VB); 10 ♂, 2 ♀, Distrito Federal, Planaltina, 5–25.xi.1975, 12.ii.1976, 6–15.xi.1977, 20.ii.1978, 21.xi.1978 (*Becker*) (VB; BMNH; MNHU; NM; NMNH); 3 ♂, 8 larvae, 4 pupae, Distrito Federal, Planaltina, 1000 m, ex *Tibouchina candolleiana*, 9–16.xi.1978 (*Becker*) (VB; BMNH;

NMNH); 1 ♀, Espirito Santo, 1910 (*Fruhstorfer*) (BMNH); 1 ♂, Minas Gerais, Leopoldina (*Staudinger*) (MNHU); 1 ♀, Maranhão (BMNH); 1 ♂, Agua Suja, x.1906 (*Baer*) (BMNH); 2 ♂, Minas Gerais, Cordisburgo, ex *Psidium guajava*, 5, 16.xi.1974 (*Becker*) (VB); 3 ♂, 2 ♀, Minas Gerais, Cordisburgo, ex *Eugenia involucrata*, 3.x–23.xi.1974 (*Becker*) (VB; BMNH); 3 ♂, Minas Gerais, Sete Lagoas, 720 m, 20.i, 10, 18.ii.1969 (*Becker*; *Biezanko*) (VB; LN); 4 ♂, 2 ♀, Minas Gerais, Sete Lagoas, 720 m, ex *Psidium guajava*, 2.x–14.xii.1974, 8.ii.1975 (*Becker*) (VB; BMNH; NMNH); 7 ♂, Paraná, Castro, 1896–1898 (*Jones*) (BMNH); 1 ♂, 1 ♀, Paraná, Curitiba, 920 m, 11.xii.1971, 2.ii.1974 (*Becker*) (VB); 2 ♂, Paraná, Mandirituba, 13.xii.1969 (*Becker*) (VB); 1 ♀, Pernambuco, Serra do Comunati (*Gounelle*) (BMNH); 1 ♂, 1 ♀, Rio de Janeiro (BMNH); 1 ♂, Rio Grande do Sul, Guarani, 7.i.1954 (*Biezanko*) (BMNH); 1 ♂, Rio Grande do Sul, Pelotas, 29.i.1960 (*Biezanko*) (BMNH); 1 ♂, Rio Grande do Sul, Pelotas, 22.i.1965 (*Guerra*) (VB); 2 ♀, Rio Grande do Sul, Santa Maria, ex *Malus domestica*, 16.ii.1979 (*Link*); 1 ♂, 2 ♀, Rio Grande do Sul, Santa Maria, ex *Pyrus communis*, 16.ii.1979 (*Link*); 1 ♂, 3 ♀, Rio Grande do Sul, Santa Maria, ex *Psidium guajava*, 17.ii.1979 (*Link*); 1 ♂, 1 ♀, Rio Grande do Sul, Santa Maria, ex *Luehea divaricata*, 28.ii.1979 (*Link*) (all VB); 1 ♂, 4 ♀, Santa Catarina, Brusque, ex *Psidium guajava*, 6–29.xii.1970 (*Becker*) (VB; BMNH; NMNH); 1 ♀, Santa Catarina, Corupá, xii.1955 (*Maller*) (NMNH); 1 ♂, Santa Catarina, Rio Vermelho, vii.1954 (*Maller*) (NMNH); 2 ♂, São Paulo, São Paulo, 1889 (*Jones*) (BMNH); 1 ♂, 1 ♀, São Paulo, 1910 (*Ihering*) (BMNH); 4 ♂, São Paulo, Piracicaba, 540 m, xii.1965–i.1966 (ESALQ).

Timocratica melanocosta **sp. n.**

(Figs 46–53, 138, 139, 173)

♂ 14–18 mm, ♀ 16–19 mm. Frons white. Second segment of labial palpus golden-ochreous, white internally and around distal articulations; third segment black with white scales towards base. Fore coxa below, femur and basal two-thirds of tibia golden-ochreous above; distal third of tibia, and tarsus dark fuscous below, mixed with white scales above; distal joint of mid femur, and tibia golden-ochreous externally, mid tarsus dark fuscous below, or white, proximal articulations of hind tibia slightly tinged with golden-ochreous. Fore wing with costa strongly arched at base, then gently arched, apex angled, termen slightly obliquely rounded, tornus rounded; veins free; basal third of costa tinged with dark grey; white below. Hind wing and abdomen white.

GENITALIA ♂ (Figs 138, 139). Lateral margins of uncus nearly parallel, apex strongly concave, nearly bifurcate. Apex of gnathos nearly triangular. Digitate processes of juxta broadened basally, narrowing progressively to basal third, then straight; distal half with sparse setae dorsally. Valva with margins nearly parallel, sacculus slightly pronounced. Aedeagus nearly straight, vesica with strong cornutus and many acutely pointed spines opposite.

GENITALIA ♀ (Fig. 173). Margin of ostium bursae rounded. Antrum funnel-shaped, bent, with strong longitudinal wrinkles. Ductus bursae broadening progressively towards corpus bursae. Corpus bursae pear-shaped, walls slightly wrinkled as in ductus bursae. Signum a round or elliptical plate without spines at middle.

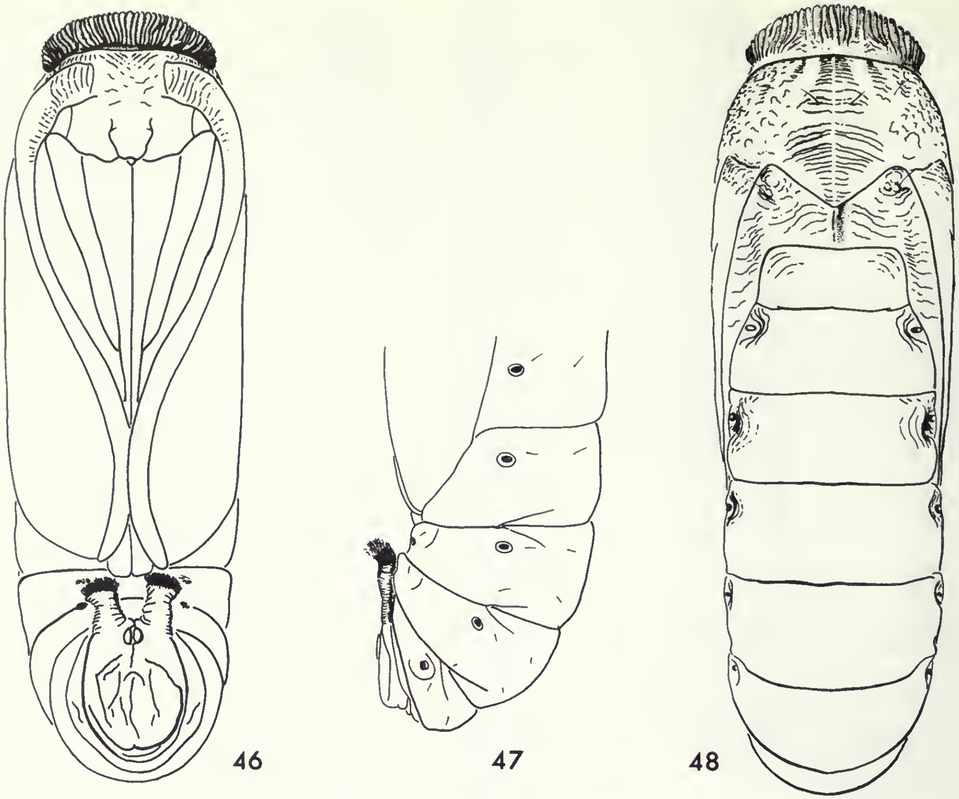
PUPA (Figs 45–47). ♂, length 16–17 mm, maximum diameter 4.5–5.0 mm. Brown, darker towards head. Setae minute. Pronotum strongly expanded forwards, displacing pronotum-head suture to a ventral position, longitudinally wrinkled. Meso- and metanotum irregularly wrinkled. Cremaster with pair of long processes, directed cephalad, reaching sixth segment, apices with many small, hook-like setae.

LARVA. Maximum length 30 mm. Very similar to that of *palpalis* and almost indistinguishable from it, except for the following characters: extra sclerotized area, 'pinaculum without setae', behind spiracle greatly reduced on abdominal segments 3–4, absent on segments 5–7.

REMARKS. *T. melanocosta* is nearest to *palpalis*, but easily distinguishable from it, and others in the group, by the grey tinge along the basal third of the fore wing costa.

Specimens from Bananal Island, reared from *Byrsonima* sp., have the mid tarsus almost white whereas most specimens, such as those from Minas Gerais and Distrito Federal, have tarsi which are dark fuscous below. However, in all other respects, including genitalia, the specimens agree very well.

BIOLOGY. The behaviour and feeding habits of the larvae of this species are almost the same as in *palpalis* (Figs 50–52). Most of the specimens studied were obtained from larvae feeding on *Erythroxylum suberosum* (Erythroxylaceae) and *Byrsonima* sp. (Malpighiaceae).



Figs 46–48 *Timocratica melanocosta* sp. n., pupa. 46, ventral view. 47, lateral view. 48, dorsal view.

DISTRIBUTION (Fig. 53). Brazil (Central Plateau and dry areas of the southern border of the Amazon Basin). Specimens were collected in Tropical Premontane Moist Forest and Tropical Moist Forest. However, it is important to point out that its host plants are not part of a climatic association, but are one of the components of the atmospheric monsoon-type of association called 'cerrado' in Brazil (Fig. 49) (see discussion of this association under *major*, p. 231).

MATERIAL EXAMINED

34 ♂, 27 ♀, 8 larvae, 4 pupae (6 ♂, 5 ♀ genitalia preparations).

Holotype ♂, **Brazil**: Distrito Federal, Planaltina, 1000 m, 9.xi.1977 (*Becker*) (MN).

Paratypes. **Brazil**: 4 ♂, 3 ♀, Minas Gerais, Sete Lagoas, 720 m, ex *Erythroxylum suberosum*, 13.x–18.xi.1974, 26.x.1978 (*Becker*) (VB; BMNH); 2 ♂, 1 ♀, Distrito Federal, Brasilia, 1000 m, 10.x.1979 (*Gomes*) (VB); 8 ♂, 2 ♀, Distrito Federal, Planaltina, 1000 m, 5.xi, 23.xi, 16.xii.1975, 11.xi.1977, 26.x–10.xi.1978 (*Becker*) (VB; BMNH; MNHU; NMNH); 19 ♂, 21 ♀, 8 larvae, 4 pupae, Goiás, Bananal I., ex *Byrsonima* sp., 24.x–15.xi.1977 (*Becker*) (VB; BMNH; LN; MNHU; NM; NMNH; ZSBS).

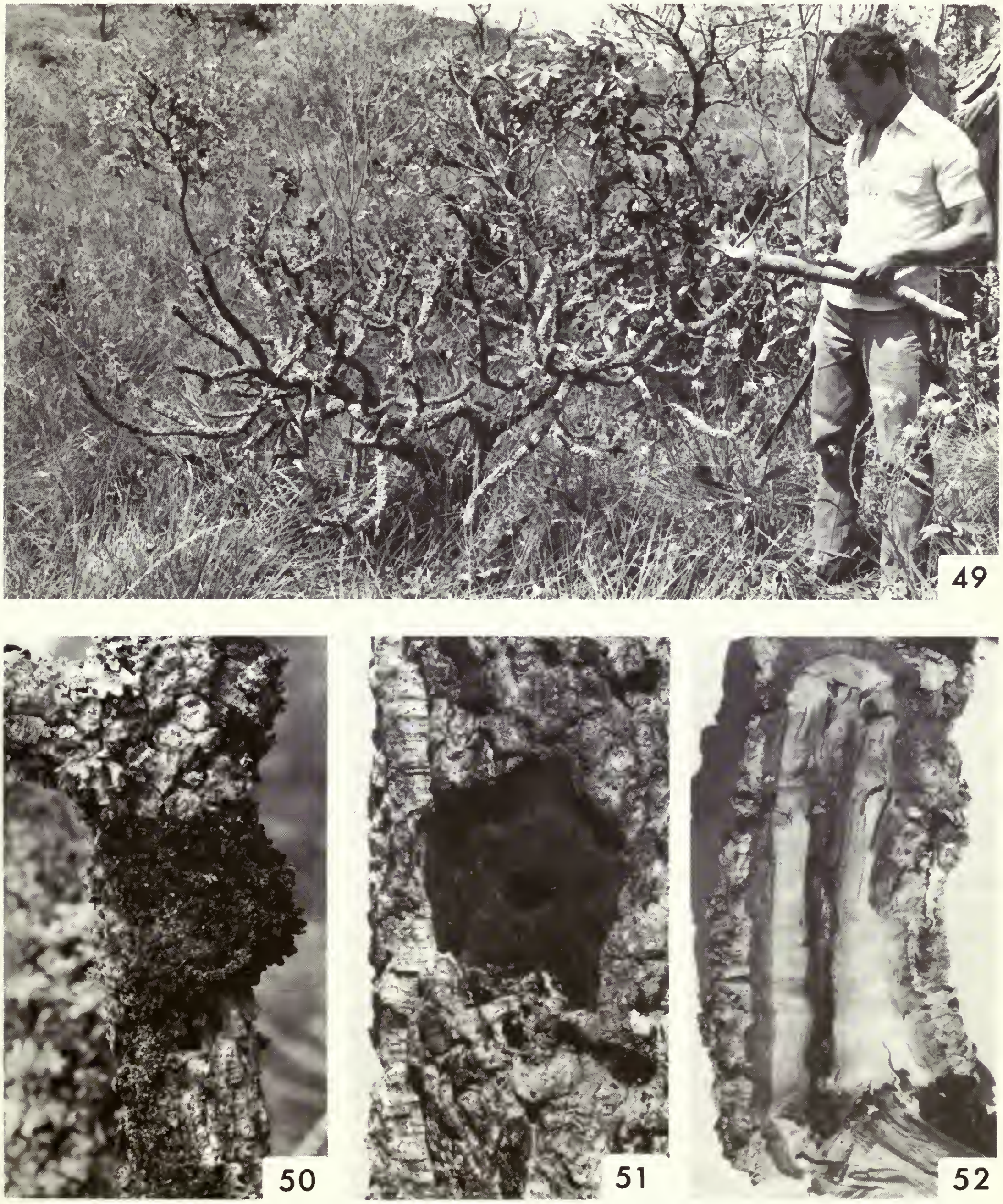
Timocratica nivea sp. n.

(Figs 22–24, 54, 140, 141, 171)

♂ 15–17 mm, ♀ 19–20 mm. Frons white. Second segment of labial palpus white with black scales basally above; third segment white below, black above. Legs white; fore coxa tinged with golden-yellow, fore femur above, tibia and tarsus dark grey below. Fore wing with basal third of costa arched, distal two-thirds nearly straight; apex angled, termen and tornus obliquely rounded; veins free or CuA_1 and CuA_2 connate or stalked; white below. Hind wing and abdomen white.

GENITALIA ♂ (Figs 140, 141). Lateral margins of uncus nearly parallel; apex strongly concave, nearly bifurcate. Apex of gnathos pointed. Digitate processes of juxta with lateral margins parallel, narrowing progressively near apex, with sparse setae on distal half dorsally. Valva with margins nearly parallel or somewhat broadened at middle, bent dorsally. Aedeagus bent ventrad at basal third, vesica with strong bent cornutus and many smaller spines of different sizes opposite.

GENITALIA ♀ (Fig. 143). Margin of ostium bursae rounded. Antrum wide, somewhat narrowed towards anterior end, with a few strong longitudinal wrinkles. Ductus bursae broadening progressively towards



Figs 49–52 Habitat and food-plant (*Erythroxylum suberosum*) of *Timocratica melanocosta* sp. n. 49, habitat and food-plant. 50–52, branches of the food-plant showing (50) eaten areas of bark covered with frass, (51) eaten area exposed with entrance hole of larval gallery, (52) split branch with gallery and pupa.

corpus bursae, scobinate. Corpus bursae pear-shaped, finely scobinate. Signum a round plate without spines at middle.

REMARKS. *T. nivea* is similar to *melanocosta*, *albella* and *isarga* but is easily distinguished by the absence of ochreous coloration on its labial palpi. The male and female genitalia are very close to those of *melanocosta*, except for the narrow base of the digitate processes of the juxta in the male. The arrangement of the *CuA* veins is very variable. Of 11 specimens examined, two females and four males have these veins free, two have them connate, two shortly stalked, and in one specimen they are connate on the left wing and shortly stalked on the right (Figs 22–24).

DISTRIBUTION (Fig. 53). Brazil (Central Plateau). This species is sympatric with *melanocosta* (see discussion on ecology under that species, p. 262).

MATERIAL EXAMINED

10 ♂, 3 ♀ (3 ♂, 2 ♀ genitalia preparations).

Holotype ♂, **Brazil**: Distrito Federal, Planaltina, 1000 m, 15.xi.1975 (*Becker*) (MN).

Paratypes. **Brazil**: 1 ♂, Minas Gerais, Sete Lagoas, 720 m, 18.x.1969 (*Becker*) (VB); 8 ♂, 3 ♀, Distrito Federal, Planaltina, 1000 m, 5–15.xi.1975, 11.xi.1976, 10.xi.1978, 10.x.1979 (*Becker*, *Gomes*) (VB; BMNH; NMNH; MNHU).

Timocratica albitogata sp. n.

(Figs 53, 144, 145, 167)

♂ 19–25 mm, ♀ 25–28 mm. Frons white. Second segment of labial palpus dark grey above on basal half, tinged with ochreous basally below, white internally; third segment white, becoming progressively black from basal third to apex. Fore coxa and femur golden-ochreous below, fore tibia and tarsus dark greyish-fuscous below; distal half of tibia, and tarsus white above; mid and hind tarsus golden-ochreous. Fore wing with costa gently, evenly rounded; apex nearly rounded, somewhat angled; termen and tornus obliquely rounded; veins free; white below. Hind wing and abdomen white.

GENITALIA ♂ (Figs 144, 145). Uncus with lateral margins nearly parallel, apex strongly concave. Apex of gnathos narrow. Digitate processes of juxta very long, lateral margins nearly parallel, distal half with long setae above. Valva long, margins evenly rounded, nearly parallel, narrowing progressively from apical third to apex. Aedeagus nearly straight, vesica with strong bent cornutus and several smaller spines.

GENITALIA ♀ (Fig. 167). Margin of ostium bursae nearly straight. Antrum very wide posteriorly, narrowing progressively towards ductus bursae, with few longitudinal wrinkles. Ductus bursae somewhat constricted near antrum, widening progressively towards corpus bursae. Corpus bursae pear-shaped, walls wrinkled longitudinally as in ductus bursae. Signum an elongate elliptical plate without spines at centre.

REMARKS. *T. albitogata* is very close to *palpalis*, but usually larger. Like *melanocosta*, it can easily be distinguished from *palpalis* by the white underside of the fore wings and the white dorsal side of the fore tarsi. It differs from *melanocosta* by its larger size, white fore wing costa and ochreous hind tarsi.

DISTRIBUTION (Fig. 53). South-east Brazil. This species appears to be restricted to the Subtropical Region of South America. The localities where the type-series was collected are in Subtropical Moist Forest, Subtropical Lower Montane Moist Forest and Subtropical Lower Montane Wet Forest. It can be expected to occur further south, in the Warm Temperate Moist Forest of Rio Grande do Sul and possibly in Uruguay and Argentina.

MATERIAL EXAMINED

21 ♂, 4 ♀ (3 ♂, 2 ♀ genitalia preparations).

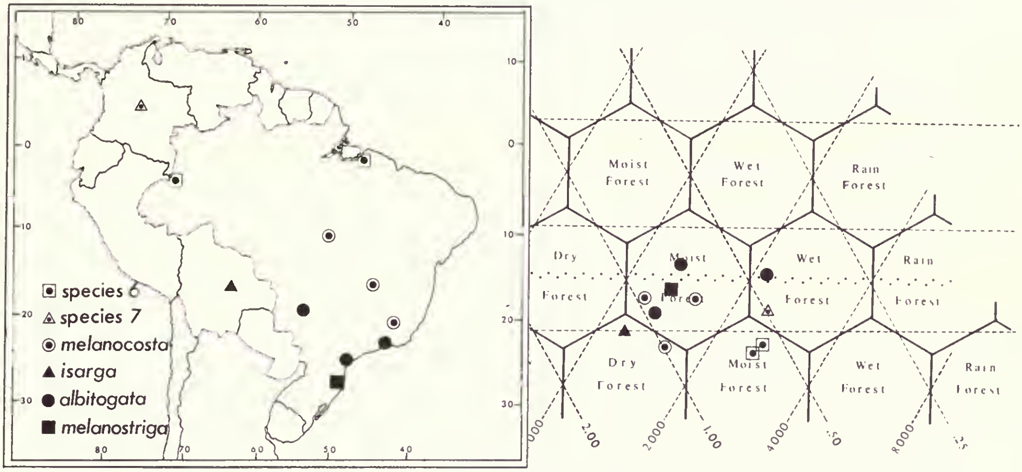
Holotype ♂, **Brazil**: Paraná, Curitiba, 920 m, 10.ii.1975 (*Becker*) (MN).

Paratypes. **Brazil**: 17 ♂, 4 ♀, Paraná, Curitiba, 920 m, xii.1974–ii.1975 (*Becker*) (VB; BMNH; NMNH; NM; MNHU; ZSBS); 2 ♂, Mato Grosso, Rio Brilhante, 25.i.1971 (*Becker*) (VB); 1 ♂, Rio de Janeiro, [? Itatiaia] (*Zikán*) (NMNH).

Timocratica species 6

(Figs 53, 165)

♀ 23–27 mm. Frons white, edged with fuscous. Second segment of labial palpus ochreous below, basal half dark fuscous above, distal half white above and internally; third segment white, fuscous towards apex. Antenna fuscous, except scape and base of flagellum white. Fore femur above, distal half of tibia above and fore tarsus dark fuscous; fore coxa below, mid and hind tarsi golden-yellow. Fore wing with costa gently arched, apex angled, termen and tornus rounded; veins free; underside golden-yellow, fuscous along apex and termen. Hind wing tinged with golden-yellow along costa and termen. Abdomen white.



■ species 6
▲ species 7
◉ melanocosta
▲ isarga
● albitogata
■ melanostriga
80
70
60
50
40
10
0
10
20
30
Moist Forest
Wet Forest
Rain Forest
Dry Forest
Moist Forest
Wet Forest
Rain Forest
Dry Forest
Moist Forest
Wet Forest
Rain Forest
6°C
12°C
24°C
1000
2.00
2000
1.00
4000
.50
8000
.25

Fig. 53 Geographical and ecological distribution of the *albella*-group of *Timocratica.*

GENITALIA ♀ (Fig. 165). Margin of ostium bursae slightly concave. Antrum long, posterior third funnel-shaped, anterior two-thirds strongly wrinkled longitudinally, bent at connection with ductus seminalis. Ductus bursae broadening progressively towards corpus bursae. Corpus bursae oblong, walls slightly wrinkled longitudinally as in ductus bursae. Signum an elongate plate without spines along middle.

REMARKS. This species is very similar to *argonais* but can easily be distinguished by the hind wings which are tinged with yellow above along the costa and termen, and by the narrow antrum of the female genitalia.

Although the ecology of the Bolivian specimen differs from that of specimens from Brazil, their genitalia are similar; because of the poor condition of the Bolivian specimen they cannot be separated on superficial characters.

DISTRIBUTION (Fig. 53). Bolivia, Brazil. Both Brazilian localities are in Tropical Moist Forest; the Bolivian locality is in a transitional zone between Subtropical Moist Forest and Tropical Premontane Dry Forest.

MATERIAL EXAMINED

3 ♀ (2 genitalia preparations).

Bolivia: 1 ♀, Santa Cruz, Santa Cruz de la Sierra (*Steinbach*) (BMNH). **Brazil**: 1 ♀, Amazonas, Benjamin Constant, xi.1942 (*Pohl*) (NMNH); 1 ♀, Pará, Belém (*Moss*) (BMNH).

Timocratica species 7

(Figs 53, 166)

♀ 22 mm. Frons white, edged with light fuscous. Second segment of labial palpus white, basal half ochreous below and dark fuscous externally above; third segment dark fuscous, few white scales basally. Antenna white, slightly fuscous towards apex. Fore coxa below, fore and mid femur above, basal half of fore tibia above, mid and hind tarsi golden-yellow; distal half of fore tibia above and fore tarsus dark fuscous. Fore wing with costa gently arched, apex right-angled, termen and tornus rounded; golden-ochreous below above cell, dark fuscous along apex and termen. Hind wing upperside white, underside golden-yellow along costa. Abdomen white.

GENITALIA ♀ (Fig. 166). Margin of ostium bursae slightly concave. Antrum long, posterior third nearly cylindrical, anterior two-thirds curved, strongly wrinkled longitudinally. Ductus bursae nearly cylindrical. Corpus bursae oblong, walls plain and smooth. Signum an elongate plate without spines along middle.

REMARKS. This species is very similar externally to species 6 and to *argonais*; however, it can easily be distinguished from the former by the white upperside of the hind wings, and from the latter by the narrower antrum and undivided signum. It almost certainly represents a distinct species, but as no males are known it has not been named here.

DISTRIBUTION (Fig. 53). Colombia. The locality where the only specimen was collected is presumably in Tropical Premontane Wet Forest.

MATERIAL EXAMINED

Colombia: 1 ♀, Cundinamarca, Medina (*Fassl*) (BMNH).

Timocratica melanostriga sp. n.

(Figs 53, 68, 174)

♀ 21 mm. Frons white. Second segment of labial palpus golden-ochreous except distal half above and around distal articulation; third segment dark grey with a few white scales basally. Antenna dark fuscous, scape and base of flagellum white. Fore coxa, femur and tibia golden-ochreous, distal third of tibia except articulations dark greyish fuscous; tarsus dark greyish-fuscous, ochreous on articulations; distal half of mid femur ochreous below, tinged with grey externally at middle; mid tibia fuscous with ochreous scales above, tarsus fuscous with ochreous scales; third tarsus ochreous below with fuscous scales. Thorax and abdomen white with a dark grey mediodorsal line. Fore wing with costa gently arched, apex rounded, termen and tornus obliquely rounded; veins free; basal half of veins $R_3 - M_3$, $1A + 2A$, fold and middle of cell dashed with dark greyish-fuscous; underside white, same veins marked with fuscous. Hind wing with veins and dorsal half of cell fuscous.

GENITALIA ♀ (Fig. 174). Margin of ostium bursae slightly expanded posteriorly, concave at middle. Antrum slightly constricted after insertion of ductus seminalis, anterior two-thirds narrowing slightly towards ductus bursae, walls scobinate and wrinkled longitudinally. Ductus bursae widening progressively towards corpus bursae. Corpus bursae pear-shaped, walls as in ductus bursae, finely scobinate. Signum a small, irregular plate.

REMARKS. *T. melanostriga* is the only white *Timocratica* species with dark markings on the wings. The female genitalia, mainly the shape of the ostium, put this species close to *palpalis* and its allies; however, its correct position cannot be ascertained until males are known.

DISTRIBUTION (Fig. 53). Brazil. The only specimen was collected in the lowlands on the coast of Santa Catarina, which is in Subtropical Moist Forest, transitional to Warm Temperate Moist Forest.

MATERIAL EXAMINED

Holotype ♀, **Brazil**: Santa Catarina (*Hoffmann*) (NMNH).

Timocratica isarga (Meyrick)

(Figs 53, 172)

Stenoma isarga Meyrick, 1925: 224. Holotype ♀, BOLIVIA (BMNH) [examined].

Timocratica isarga (Meyrick) Busck, 1935: 17 [catalogue]; Clarke, 1955: 388, pl. 194, figs 3–3c [adult, genitalia].

♀ 19 mm. Frons white. Basal half of second segment of labial palpus tinged with ochreous externally and with dark fuscous above, white internally; third segment dark fuscous with white scales basally. Fore coxa below and basal half of tibia above ochreous; fore femur above, distal half of tibia, and tarsus dark fuscous with few white scales on articulations; articulations of mid femur, near tibia, tinged with golden-yellow. Fore wing with basal third of costa arched, distal two-thirds nearly straight; apex rounded, slightly angled, termen and tornus obliquely rounded; CuA_1 and CuA_2 shortly stalked; white below. Hind wing and abdomen white.

GENITALIA ♀ (Fig. 172). Margin of ostium bursae evenly concave. Antrum widened posteriorly, abruptly narrowed at middle, anterior half with margins nearly parallel, wrinkled longitudinally. Ductus bursae broadening progressively towards corpus bursae. Corpus bursae pear-shaped; walls, as in ductus bursae, plain. Signum an elongate plate without spines along middle.

REMARKS. *T. isarga* is very similar to *palpalis*, *melanocosta* and *nivea*, but is easily distinguished from the first by the stalked CuA_1 and CuA_2, the plain white underside of the fore wings and white hind tarsi, and from the last two by the fuscous fore tarsi. The genitalia are very similar to those of *melanocosta* from which, however, it differs by the white costa of the fore wings. *T. nivea* has no yellow on the palpi and legs. Clarification of the relationship of *isarga* within the group depends upon the discovery of males.

DISTRIBUTION (Fig. 53). Bolivia (eastern side of the Andes); in Warm Temperate Moist Forest. According to Dr Holdridge (*in litt.*) this area is affected periodically by frost, resulting from cold air masses which come from Antarctica, and is colder than would be suggested by the mean annual temperature. According to the meteorological data it should be classified as Tropical Premontane Dry Forest, transitional to Subtropical Moist Forest.

MATERIAL EXAMINED

Bolivia: holotype ♀, Santa Cruz, Prov. del Sara, 450 m, xi (*Steinbach*) (BMNH).

Timocratica albella (Zeller)

(Figs 54, 75, 175)

Depressaria (*Volucra*) *albella* Zeller, 1839: 197. Holotype ♀, SURINAM (BMNH) [examined].
Cryptolechia albella (Zeller) Zeller, 1854: 377 [redescription]; Walker, 1864: 713 [catalogue].
Timocratica albella (Zeller) Busck, 1935: 16 [catalogue].

♀ 17 mm. Frons white. Second segment of labial palpus tinged with golden-yellow below, basal half tinged with fuscous above, white internally; third segment white externally, dark fuscous internally. Fore tarsus white above; fore coxa below, femur and basal half of tibia above golden-yellow, distal half of tibia, and tarsus dark fuscous below; mid and hind legs white. Fore wing with costa gently arched, apex right-angled, termen and tornus obliquely rounded; veins free; costa golden-yellow on underside. Hind wing white. Abdomen with second to fourth tergites tinged golden-yellow.

GENITALIA ♀ (Fig. 175). Ostium bursae wide, expanded posteriorly, concave at middle. Antrum very wide, funnel-shaped, anterior half with a few wrinkles. Ductus bursae broadening progressively towards corpus bursae, walls finely scobinate. Corpus bursae pear-shaped. Signum a long, transverse plate, concave across middle.

REMARKS. *T. albella* is very similar externally to *nivea* and *guarani*, but is easily distinguished from the former by the yellow tinge on its abdomen, fore legs, palpi and underside of the fore wing costa; from *guarani* it can be separated by the white head. The female genitalia are distinct from others in the group by the very broad antrum and the expansion of the margin of the ostium bursae. However, the relationship of this species within the group must remain unknown until males are discovered.

Although *albella* is known only from the holotype there are at least 50 references to it in the Brazilian literature; these are based on misidentifications, probably through following Bondar (1913) and Lima (1928; 1936; 1945), and most apply to *palpalis*.

DISTRIBUTION (Fig. 54). Surinam; probably from Paramaribo which is in Tropical Moist Forest.

MATERIAL EXAMINED

Surinam: holotype ♀, no further data (BMNH).

Timocratica guarani sp. n.

(Figs 54, 76, 142, 143)

♂ 12–14 mm. Frons white, edged with fuscous and few ochreous scales. Basal two-thirds of second segment of labial palpus ochreous externally, dark grey above, distal third and internally white; third segment dark fuscous with white scales basally. Fore coxa, femur and tibia ochreous below; distal half of tibia, and tarsus white above, dark fuscous below; distal articulations of mid and hind femora tinged with golden-ochreous. Fore wing with costa gently arched, apex somewhat angled, termen and tornus obliquely rounded; veins free, CuA_1 and CuA_2 very close basally in some specimens; underside golden-ochreous above cell. Hind wing white. Abdomen slightly tinged with cream-yellow dorsally.

GENITALIA ♂ (Figs 142, 143). Uncus with lateral margins nearly parallel, apical third with long sparse setae in some specimens, apex strongly concave. Apex of gnathos broadly rounded. Digitate processes of juxta with basal half broad, distal half narrow, covered with long sparse setae. Basal half of valva with margins nearly parallel, then narrowing progressively towards apex, sacculus slightly expanded. Aedeagus bent basally, vesica with strong bent cornutus and many acute spines of different sizes opposite.

REMARKS. *T. guarani* is externally very similar to *albella*, but their relationship cannot be clarified until males of the latter are discovered. It differs from other white species from southern South America by the white fore tarsi and yellow-tinged abdomen, and from *albella* by having the frons edged with fuscous.

DISTRIBUTION (Fig. 54). Northern Argentina and Paraguay. It appears that this is the only species restricted to Warm Temperate Dry Forest. The only other species recorded from the same region is *palpalis* (collected by Hayward in Villa Ana) which, however, is not restricted to it.

MATERIAL EXAMINED
3 ♂ (2 genitalia preparations).

Holotype ♂, **Argentina**: Santa Fé, Villa Guillermina, 20. ii.1925 (*Hayward*) (BMNH).

Paratypes. **Argentina**: 1 ♂, Santa Fé, Villa Ana, ii.1924 (*Hayward*) (BMNH). **Paraguay**: 1 ♂, Paraguay Central, 1885 (*Germain*) (BMNH).

Timocratica philomela (Meyrick)

(Figs 54, 146, 147)

Stenoma philomela Meyrick, 1925: 224. Holotype ♂, PERU (BMNH) [examined].

Timocratica philomela (Meyrick) Busck, 1935: 17 [catalogue]; Clarke, 1955: 391, pl. 195, figs 3–3b [adult, genitalia].

♂ 10 mm. Head white, edged with fuscous. Second segment of labial palpus ochreous below, basal two-thirds dark fuscous above, distal third above and internally white; third segment white, fuscous towards apex. Antenna fuscous, scape white. Fore coxa below, femur and basal half of tibia above, and tarsus dark fuscous. Hind tarsus golden-ochreous. Fore wing with costa gently arched, apex, termen and tornus evenly rounded; veins free; underside golden-yellow, slightly tinged with fuscous along apex. Hind wing tinged with cream-yellow. Abdomen white.

GENITALIA ♂ (Figs 146, 147). Uncus wide, basal half slightly constricted; apex strongly concave. Apex of gnathos wide, triangular. Digitate processes of juxta long, broadened basally, narrowing progressively towards apex, few setae at distal half dorsally. Valva slightly constricted basally, dorsal margin nearly straight, ventral margin evenly rounded. Aedeagus bent ventrad, vesica with strong bent cornutus and many spines opposite.

REMARKS. *T. philomela* is a small species similar to *butyrota* and *parvileuca* but is easily distinguished by the ochreous colour of the labial palpi.

DISTRIBUTION (Fig. 54). Peru (Amazonian side of the Andes), in Tropical Moist Forest.

MATERIAL EXAMINED

Peru: holotype ♂, Loreto, Yurimaguas, iii.1920 (*Parish*) (BMNH).

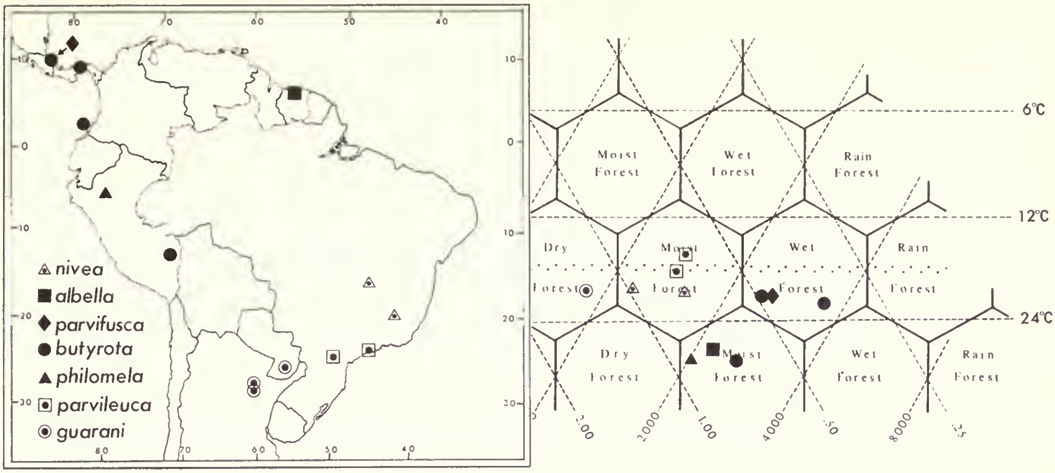


Fig. 54 Geographical and ecological distribution of the *albella*-group of *Timocratica.*

Timocratica parvileuca sp. n.

(Figs 54, 150, 151)

♂ 9–10 mm. Frons white, edged with fuscous. Second segment of labial palpus fuscous, white internally; third segment white, few fuscous scales internally towards apex. Antenna cream-yellow, scape white. Thorax cream-yellow. Fore coxa tinged with fuscous below; femur and tibia above, and tarsus dark fuscous; mid and hind legs light golden-yellow. For wings sub-oval, costa gently arched, apex, termen and tornus evenly rounded; veins free; golden-yellow below. Hind wing and abdomen cream-yellow.

GENITALIA ♂ (Figs 150, 151). Uncus narrow, basal half slightly broadened. Apex of gnathos long, narrow. Digitate processes of juxta long, narrow, distal half with several setae dorsally. Valva with margins nearly parallel or somewhat broadened at middle, dorsal margin nearly straight or somewhat bent basally, ventral margin evenly rounded. Aedeagus strongly bent ventrad, vesica with strong short cornutus and many small spines.

REMARKS. *T. parvileuca* is one of the smallest species in the genus; it is very similar to *butyrota* and *philomela*, but is easily distinguished from the former by the numerous spines of the vesica, and from the latter by the lack of ochreous coloration of the palpi. Although it is closest to *butyrota* it seems to vary less in wing venation.

DISTRIBUTION (Fig. 54). Brazil (Plateau of Paraná and São Paulo), in Subtropical Lower Montane Forest, a different Life Zone from that of its nearest related species, *butyrota*.

MATERIAL EXAMINED
4 ♂ (2 genitalia preparations).
Holotype ♂, **Brazil**: São Paulo, São Paulo (*Jones*) (BMNH).
Paratypes. **Brazil**: 2 ♂, São Paulo, São Paulo (*Jones*) (BMNH); 1 ♂, Paraná, Castro (*Jones*) (BMNH).

Timocratica butyrota (Meyrick) **comb. n.**

(Figs 16–19, 54, 74, 148, 149, 178)

Stenoma butyrota Meyrick, 1929: 516; Busck, 1935: 35 [catalogue]; Clarke, 1955: 276, pl. 138, figs 1–1c [adult, genitalia]. Holotype ♂, COLOMBIA (BMNH) [examined].
Stenoma syndicastis Meyrick, 1929: 516; Busck, 1935: 58 [catalogue]. Holotype ♂, COLOMBIA (BMNH) [examined]. **Syn. n.**
Timocratica syndicastis (Meyrick) Clarke, 1955: 392, pl. 196, figs 1–1b [adult, genitalia].

♂ 9–13 mm, ♀ 14–17 mm. Frons white, edged with fuscous. Second segment of labial palpus dark fuscous, white internally and at distal articulation; third segment white in males, dark fuscous in females. Antenna fuscous, scape white. Fore coxa fuscous below, femora and basal half of tibia golden-ochreous above, distal half of tibia, and tarsus dark fuscous; mid leg golden-yellow above; hind tarsus golden-yellow. Fore wing sub-oval, costa rounded, apex, termen and tornus evenly rounded; veins free or R_4 and R_5, and CuA_1 and CuA_2, stalked or connate; underside golden-yellow, fuscous or white along apex and termen. Hind wing tinged with cream-yellow. Second to sixth abdominal tergites cream-yellow.

Genitalia ♂ (Figs 148, 149). Lateral margins of uncus nearly parallel or slightly convergent towards apex; apex slightly concave to slightly convex. Apex of gnathos narrow. Digitate processes of juxta short, laterally compressed, with short setae dorsally. Valva with margins nearly parallel, evenly rounded, or broadened at middle; ampulla slightly pronounced. Aedeagus bent ventrad, vesica with strong, short cornutus.

Genitalia ♀ (Fig. 178). Margin of ostium bursae straight or slightly convex. Antrum wide, short, with few wrinkles anteriorly. Ductus and corpus bursae not differentiated, forming a long, wide sac. Signum a long, irregular plate.

Remarks. *T. butyrota* is very similar to *philomela* and *parvileuca*, but is easily distinguished from the former by the lack of ochreous coloration on the palpi, and from the latter by the absence of spines in the vesica.

The venation of the fore wing is very variable in this species, as it is in *nivea*. Some specimens have all the veins free, others have R_4 and R_5, and CuA_1 and CuA_2, connate or stalked, and some have R_4 and R_5 stalked very close to the apex (Figs 16–19). These two veins can be completely fused, and this is the case in the holotype of *syndicastis*, which has only eleven veins in the fore wing. Variation occurs even within the same locality, and in a large series from Turrialba, Costa Rica, specimens with all the above combinations were found.

The absence of a differentiated ductus bursae in this species is unique within the genus.

Distribution (Fig. 54). Costa Rica, Colombia and Peru. No climatic data could be obtained for Gorgona I., the type-locality, to establish the Life Zone. However, as suggested by other localities it is probably Tropical Moist Forest or Tropical Premontane Wet Forest.

Material examined
71 ♂, 10 ♀ (8 ♂, 2 ♀ genitalia preparations).

Colombia: holotype ♂ of *S. butyrota*, Cauca, Gorgona I., 60 m ('200 ft'), 7.x.1924 (*Collenette*) (BMNH); holotype ♂ of *S. syndicastis*, Cauca, Gorgona I., 60 m ('200 ft'), 7.vii.1924 (*Collenette*) (BMNH). **Costa Rica**: 61 ♂, 10 ♀, Cartago, Turrialba, 600 m, 6–15.vii, 10.xi.1971; 10.ii, 4–20.v.1972; 10–20.iv.1973 (*Becker*) (VB; BMNH; LN; MNHU; NM; NMNH; ZSBS). **Panama**: 5 ♂, Canal Zone, Barro Colorado I., 10.x–12.xii.1934 (*Bates*) (NMNH). **Peru**: 1 ♂, Puno, Carabaya, La Oroya, Rio Inambari, 1000 m ('3100 ft'), iii.1905 (*Ockenden*) (BMNH).

Timocratica parvifusca sp. n.

(Figs 20, 54, 67, 152, 153)

♂ 9 mm. Head fuscous. Second segment of labial palpus dark fuscous with dark grey scales externally, whitish internally; third segment light fuscous, whitish basally. Antenna dark fuscous. Thorax dark fuscous. Fore coxa and femora light fuscous, fore tibia and tarsus dark fuscous; mid tibia and tarsus ochreous; tarsi tinged with fuscous distally. Fore wing nearly oval; apex, termen and tornus evenly rounded; veins R_4 and R_5, CuA_1 and CuA_2 stalked, M_1 missing; dark fuscous, costa ochreous below. Abdomen fuscous above, whitish below.

Genitalia ♂ (Figs 152, 153). Uncus broad, lateral margins nearly parallel, slightly broadened at middle. Apex of gnathos long, narrow, pointed. Digitate processes of juxta slightly broadened at middle, gently curved dorsad. Aedeagus strongly curved ventrad, vesica with long curved cornutus.

Remarks. *T. parvifusca* is similar externally to *fraternella*, but differs by its smaller size, stalked R_4 and R_5, and the lack of M_1 and the oblique fasciae of the fore wings.

Despite its colour pattern, which does not agree with that of any species of the *albella*-group, there is no doubt that it belongs here. The shape of the genitalia and wings, and the venation, as well as its geographical and ecological distribution, indicate that it is very close to if not a melanic form of *butyrota*.

DISTRIBUTION (Fig. 54). Costa Rica, in Tropical Premontane Wet Forest.

MATERIAL EXAMINED

Holotype ♂, **Costa Rica**: Cartago, Turrialba, 600 m, 5.vii.1971 (*Becker*) (BMNH).

Species transferred from *Timocratica*

The following species have been included in *Timocratica* but are here transferred provisionally to *Stenoma*, although none of them seem to be congeneric with *litura* Zeller, the type-species, which is represented only by the holotype ♀ in the BMNH. Since the characters of female Stenominae are inadequate for generic divisions, the relationship of *litura* with other species in the subfamily cannot be established. It is probably congeneric with *griseana* Fabricius, the type-species of *Antaeotricha* Zeller. If this proves true, most of the species now in *Antaeotricha* should be referred to *Stenoma*, and most of the species now in *Stenoma* should be transferred to other genera, most of these still to be defined. This would involve more than 1000 new combinations. The decision to synonymize *Antaeotricha* with *Stenoma*, and the erection of new genera to accommodate species now in this genus, should be taken only after further research, and possibly not before the male of *litura* is known.

Stenoma completella (Walker)

Cryptolechia completella Walker, 1864: 718. LECTOTYPE ♀, BRAZIL: Amazonas, Tefé ['Ega'] (*Bates*) (BMNH), here designated [examined].
Timocratica completella (Walker) Busck, 1935: 16.
Stenoma completella (Walker) Duckworth, 1962: 113.

As the abdomen of the male syntype is lost, the female syntype is here selected as the lectotype; the male is labelled paralectotype. This species is very similar externally to *Antaeotricha rhipidaula* (Meyrick).

The larvae of *completella*, unlike those of *Timocratica*, skeletonize leaves tied together with silk; I have reared a specimen from a larva feeding on *Brosimum costaricanum* (Moraceae) in Costa Rica.

Stenoma convexicostata (Zeller) **comb. n.**

Cryptolechia convexicostata Zeller, 1877: 272. Holotype ♀ [not ♂ as stated by Zeller], BRAZIL: Rio de Janeiro, Nova Friburgo (MNHU) [examined].
Stenoma liniella Busck, 1910: 80. Holotype ♂, COSTA RICA: Sixaola River (*Schaus*) (NMNH) [not examined]. **Syn. n.**
Stenoma cantatrix Meyrick, 1925: 221. Holotype ♂, BOLIVIA: Santa Cruz, Prov. del Sara, 450 m, x (*Steinbach*) (BMNH) [examined]. **Syn. n.**
Timocratica cantatrix (Meyrick) Clarke, 1955: 387.
Timocratica liniella (Busck) Duckworth, 1962: 113.

The holotypes of *convexicostata* and *cantatrix*, and a paratype of *liniella* in the BMNH, have been examined and there is little doubt that they represent the same species, which is distributed from the gulf area of Mexico to south Brazil. The specimens examined show some variation in colour, some being darker than others, and in the female genitalia. However, the male genitalia are almost identical in specimens from different localities and of different colour-pattern.

Duckworth (1962: 113) pointed out that the genitalia of *liniella* and *cantatrix* are atypical for *Timocratica* and that both might require a new genus.

Stenoma grandaeva (Zeller) **comb. n.**

Cryptolechia grandaeva Zeller, 1854: 381. Holotype ♀, BRAZIL [no further data] (MNHU) [examined].
Stenoma chrysogastra Meyrick, 1915: 476. Holotype ♂, FRENCH GUIANA: St Jean du Maroni, 1915 (*Le Moult*) (BMNH) [examined]. **Syn. n.**
Timocratica grandaeva (Zeller) Busck, 1935: 16.

Although the holotype of *grandaeva* is in quite poor condition, with the abdomen, part of the antennae and most of the legs missing, there is no doubt that it is conspecific with the holotype of *chrysogastra.*

Stenoma sexmaculata (Dognin) **comb. n.**

Cryptolechia sexmaculata Dognin, 1904: 133. Holotype ♀, ECUADOR: San Francisco, near Loja (NMNH) [examined].
Timocratica sexmaculata (Dognin) Busck, 1935: 17.

Although this species has the ground colour of the fore wing white, the metallic blue-green dots, as well as its genitalia, are atypical of *Timocratica.*

Stenoma staudingerana (Maassen) **comb. n.**

Tortrix staudingerana Maassen, 1890: 25, pl. 9, fig. 29. Holotype [♂?], COLOMBIA: Villavicencio [not examined].
Stenoma contophora Meyrick, 1915: 472. Lectotype ♂, FRENCH GUIANA: Godebert, R. Maroni, 1915 (*Le Moult*) (BMNH) [examined]. **Syn. n.**
Stenoma heterosema Meyrick, 1930: 244. Holotype ♂, BRAZIL: Pará, Taperinha, 21–30.vi.1927 (*Zerny*) (NM) [examined]. **Syn. n.**
Timocratica staudingerana (Maassen) Busck, 1935: 17.

According to Horn & Kahle (1935: 162, 272) the Stübel collection, including the Maassen types, was deposited in the MNHU. Dr H.-J. Hannemann was unable to find the holotype of *staudingerana* there (pers. comm.), neither is it in the IP (Dr Gaedike, pers. comm.). However, from the excellent illustration which accompanies the description, there is no doubt that *staudingerana* represents the species described later by Meyrick as *contophora* and *heterosema.* It is widely distributed in South America; in the BMNH there are specimens from Bolivia, Brazil, Peru, French Guiana and Surinam.

The genitalia of *staudingerana* exclude this species from *Timocratica.*

Stenoma tristrigata (Zeller) **comb. n.**

Cryptolechia tristrigata Zeller, 1854: 382, pl. 3, fig. 21. Holotype ♀, BRAZIL [no further data] (MNHU) [examined].
Stenoma aphanodesma Meyrick, 1915: 478. Holotype ♂, FRENCH GUIANA: Godebert, R. Maroni, 1915 (*Le Moult*) (BMNH) [examined]. [Synonymized by Busck, 1935: 17.]
?*Timocratica tristrigata* (Zeller) Meyrick, 1912: 706; Busck, 1935: 17; Clarke, 1955: 392, pl. 196, figs 2, 2a.

Although the holotypes are of different sex there is no doubt that they belong to the same species.

The male genitalia of *tristrigata* are similar to those of *staudingerana*, and exclude both species from *Timocratica.*

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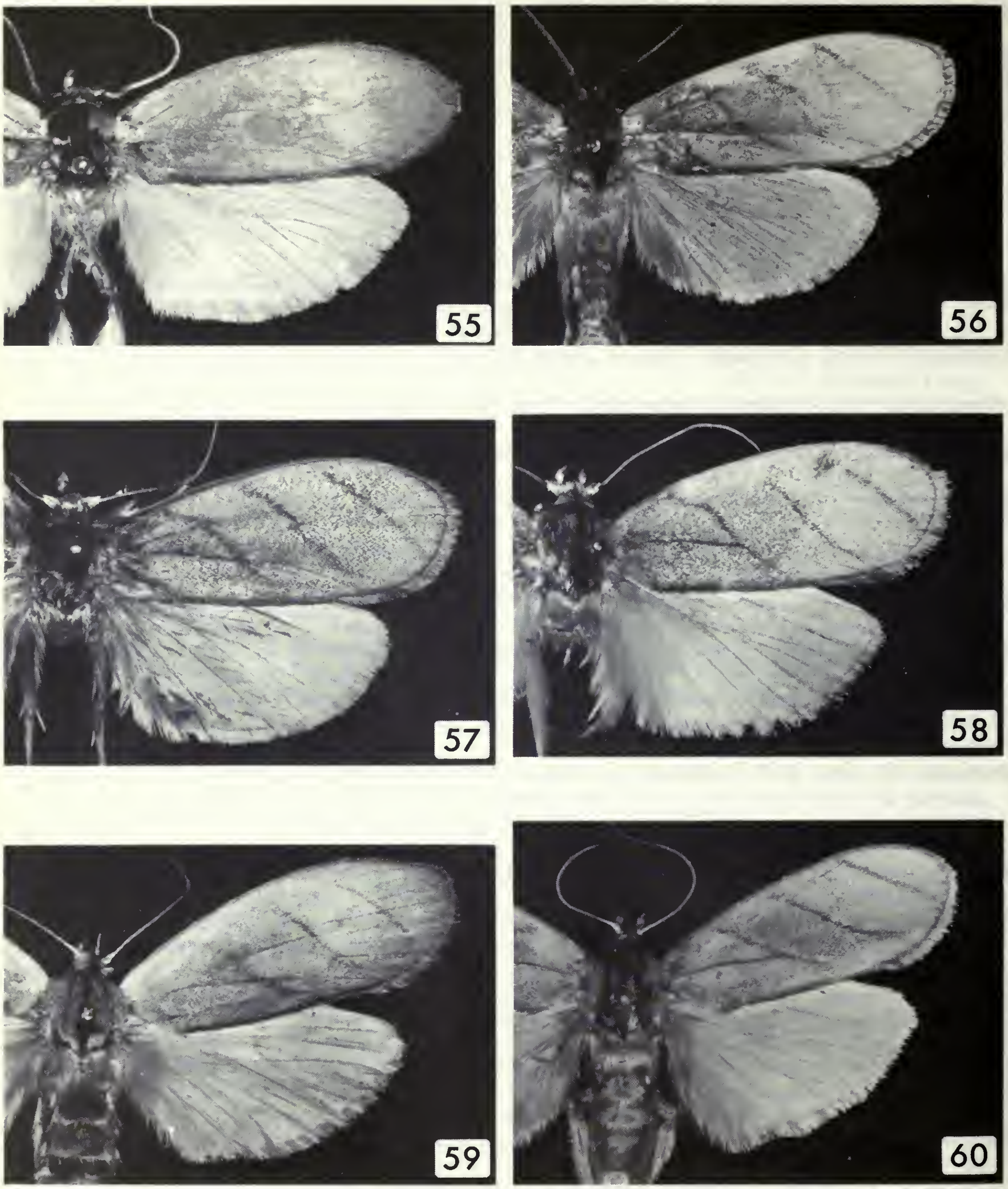
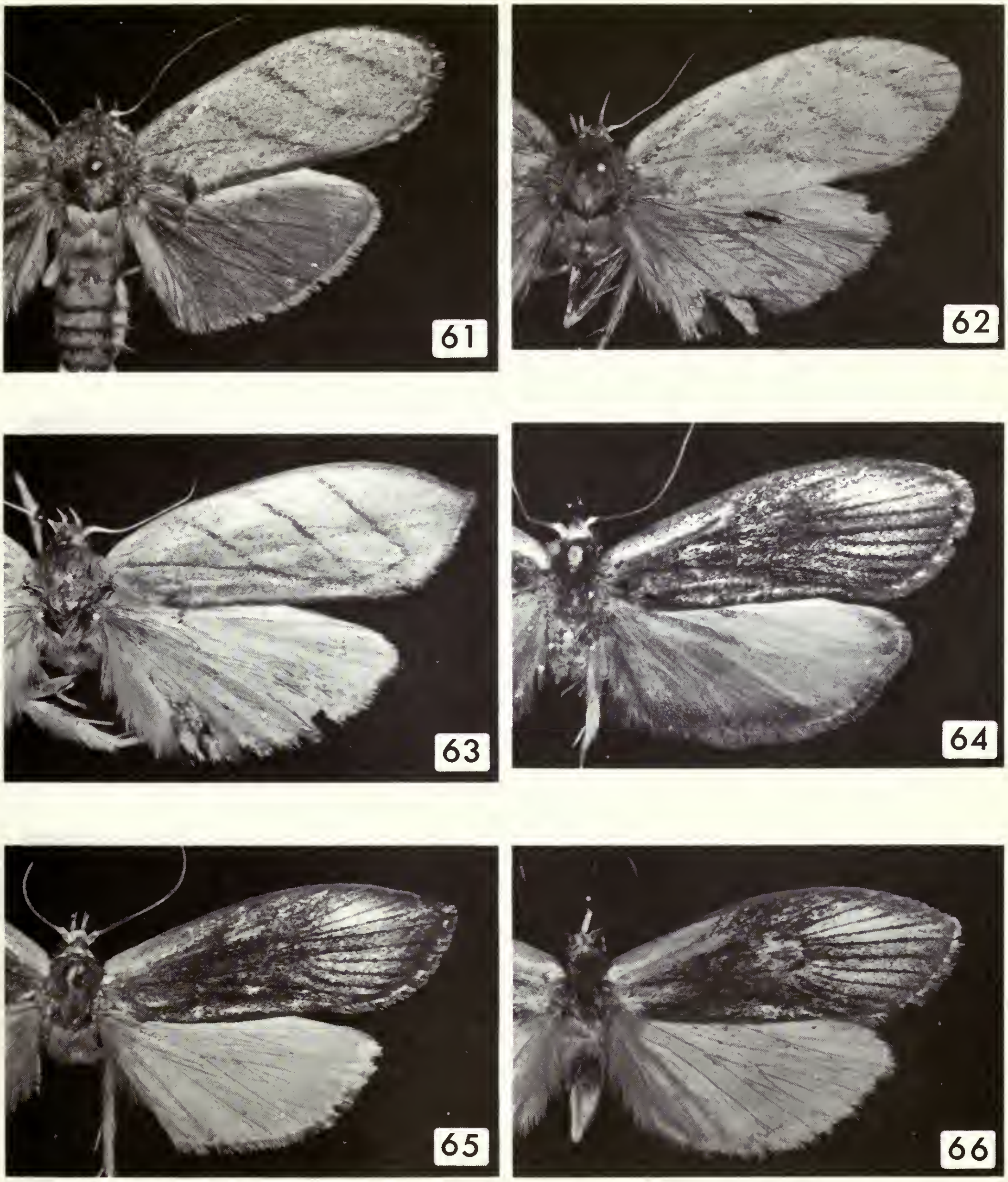
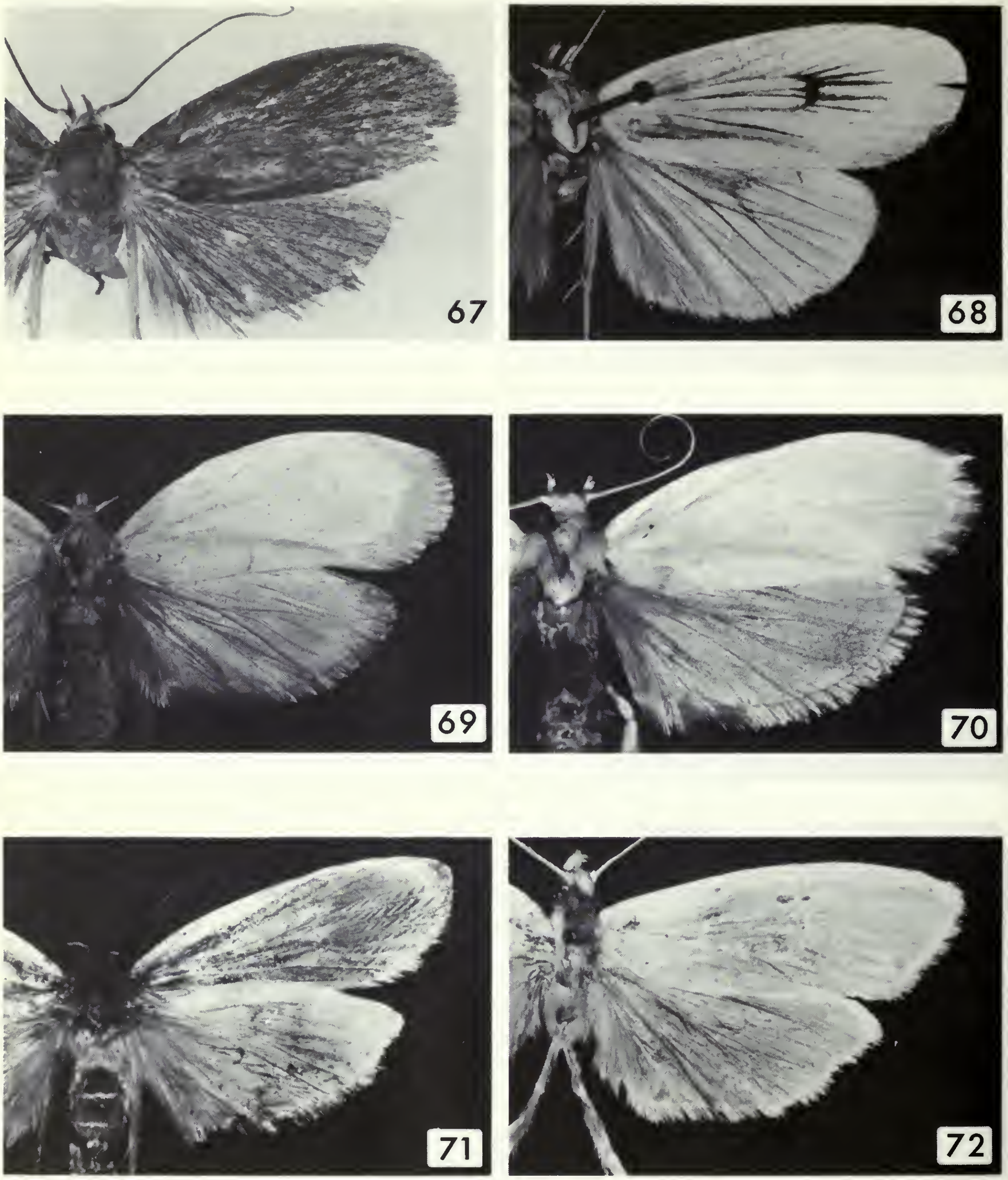


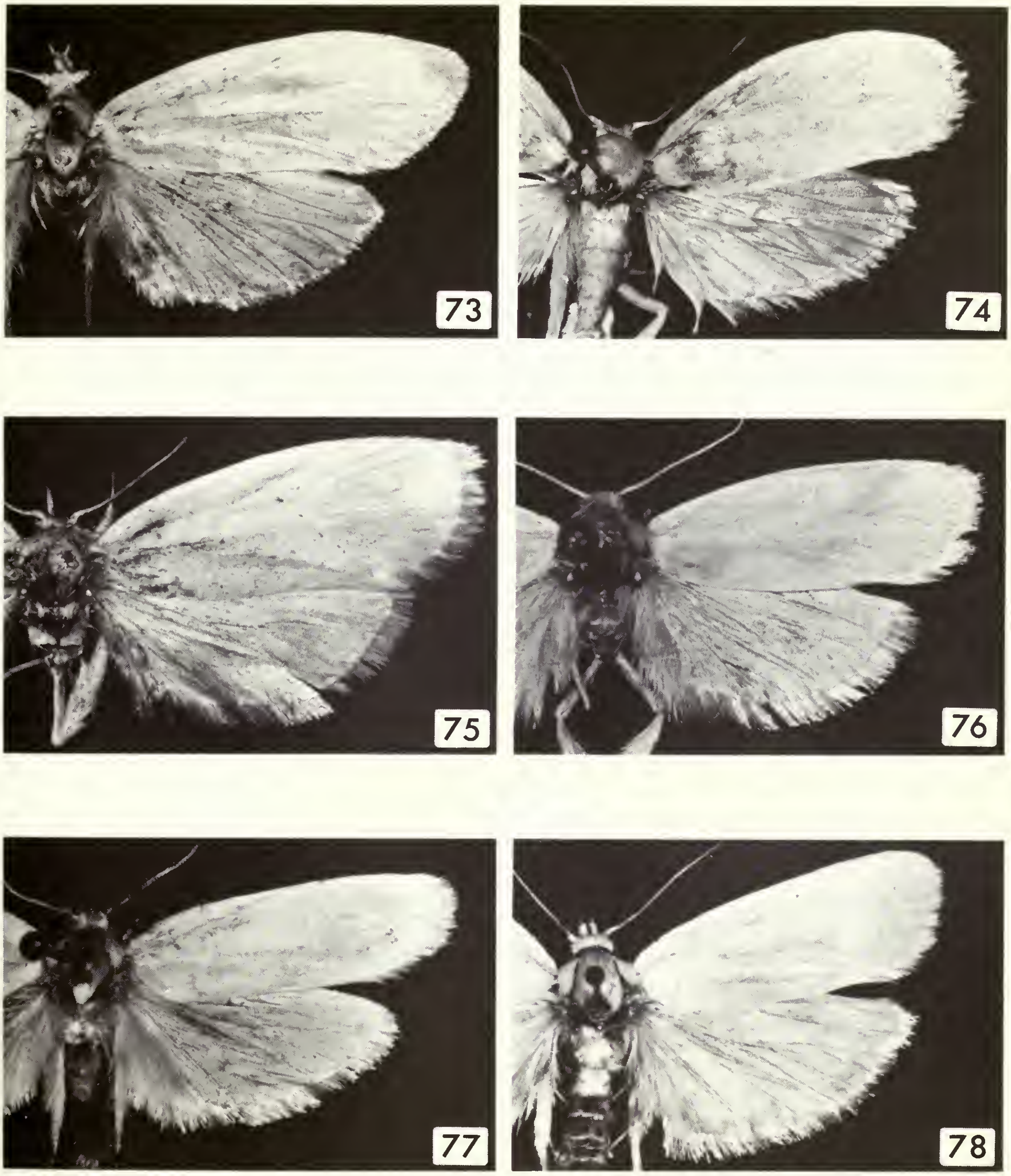
Figs 55–60 Wings of *Timocratica* species. 55, *T. agramma* sp. n., holotype ♂, Brazil. 56, *T. longicilia* sp. n., holotype ♂, Colombia. 57, *T. pompeiana* Meyrick, ♂, Peru. 58, *T. monotonia* (Strand), ♂, Venezuela. 59, *T. meridionalis* sp. n., holotype ♂, Brazil. 60, *T. loxotoma* (Busck), ♂, Mexico.



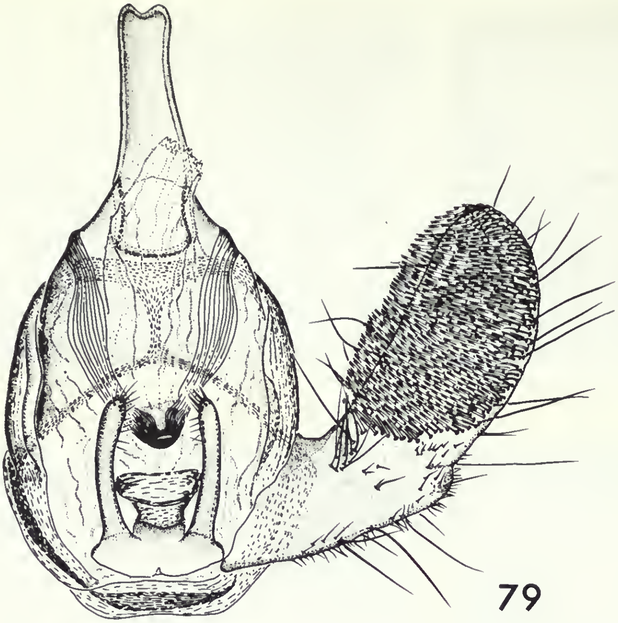
Figs 61–66 Wings of *Timocratica* species. 61, *T. fraternella* (Busck), ♂, Costa Rica. 62, *T.* species 1, ♀, Costa Rica. 63, *T. major* (Busck), ♀, Brazil. 64, *T. effluxa* (Meyrick), holotype ♂, Bolivia. 65, *T.* species 2, ♂, Peru. 66, *T. leucocapna* (Meyrick), holotype ♂, Colombia.



Figs 67–72 Wings of *Timocratica* species. 67, *T. parvifusca* sp. n., holotype ♂, Costa Rica. 68, *T. melanostriga* sp. n., holotype ♀, Brazil. 69, *T. grandis* (Perty), ♀, French Guiana. 70, *T. xanthotarsa* sp. n., holotype ♂, Panama. 71, *T. anelaea* (Meyrick), ♂, Brazil. 72, *T. macroleuca* (Meyrick), ♂, Bolivia.



Figs 73–78 Wings of *Timocratica* species. 73, *T. titanoleuca* sp. n., holotype ♂, Peru. 74, *T. butyrota* (Meyrick), ♂, Costa Rica. 75, *T. albella* (Zeller), holotype ♀, Surinam. 76, *T. guarani* sp. n., holotype ♂, Argentina. 77, *T. xanthosoma leucocephala* subsp. n., holotype ♂, Panama. 78, *T. venifurcata* sp. n., holotype ♂, Brazil.



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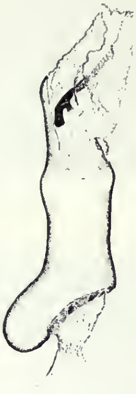

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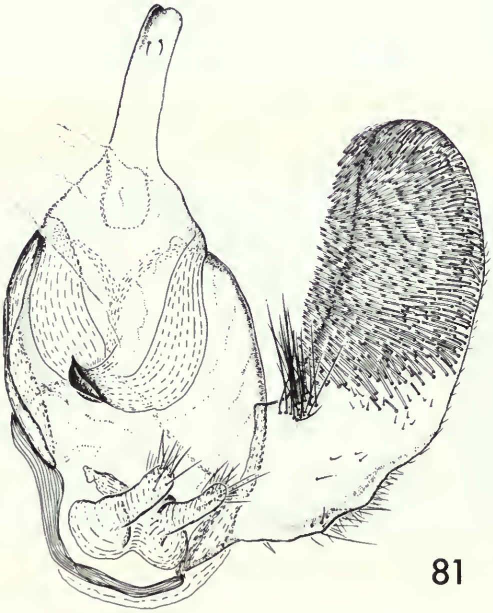

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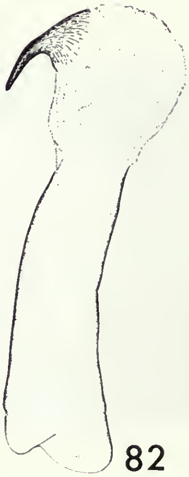

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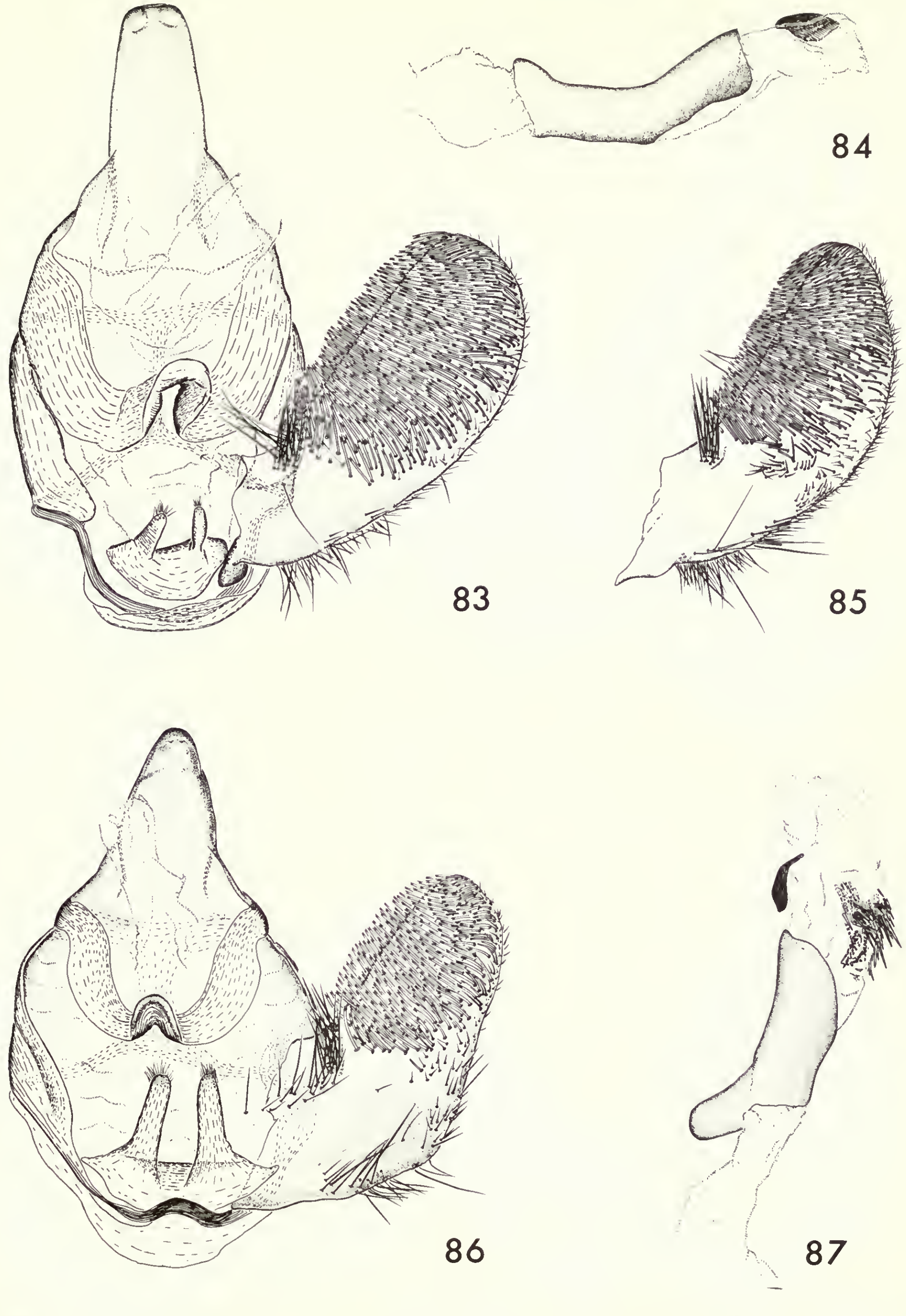
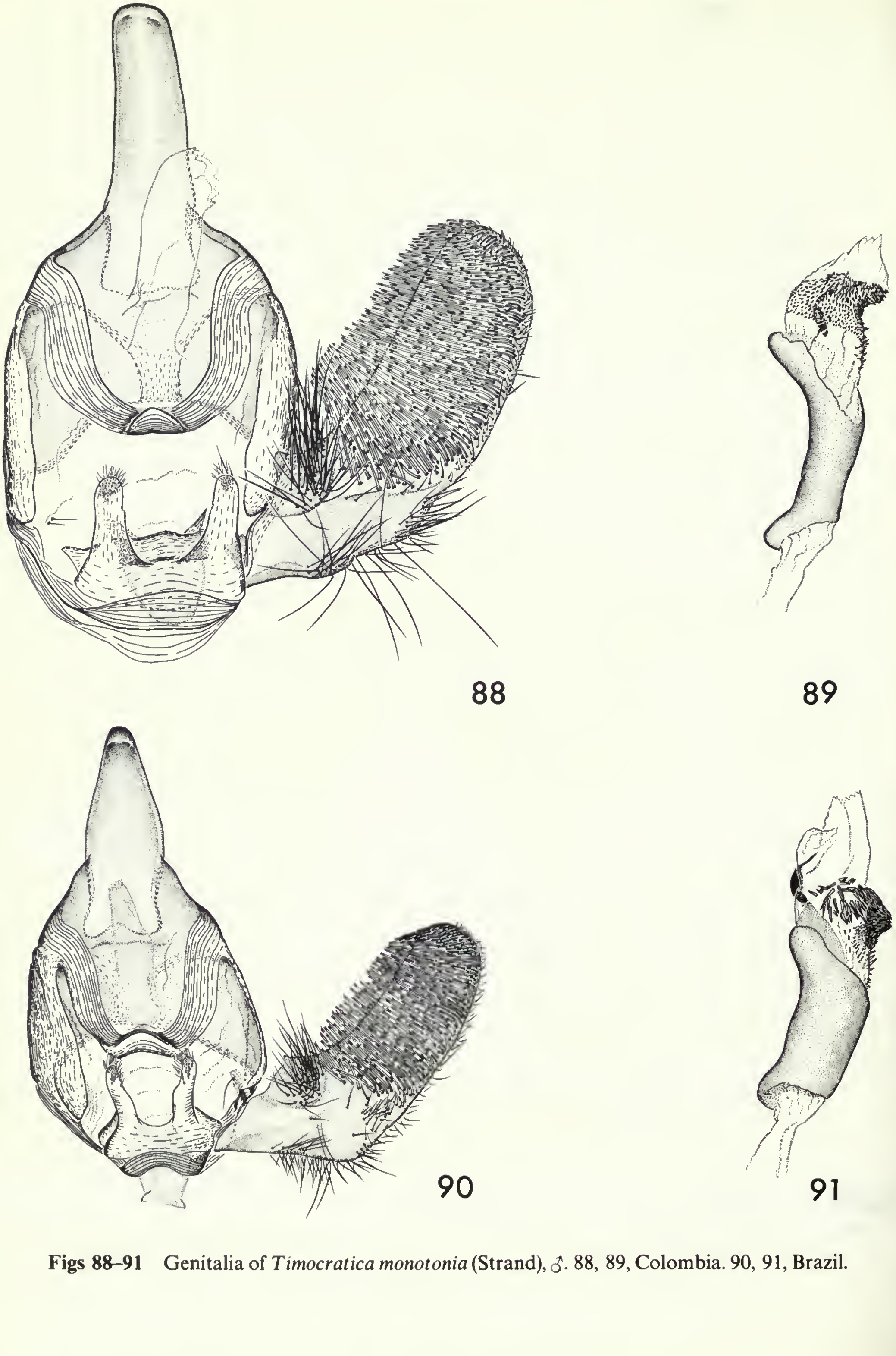
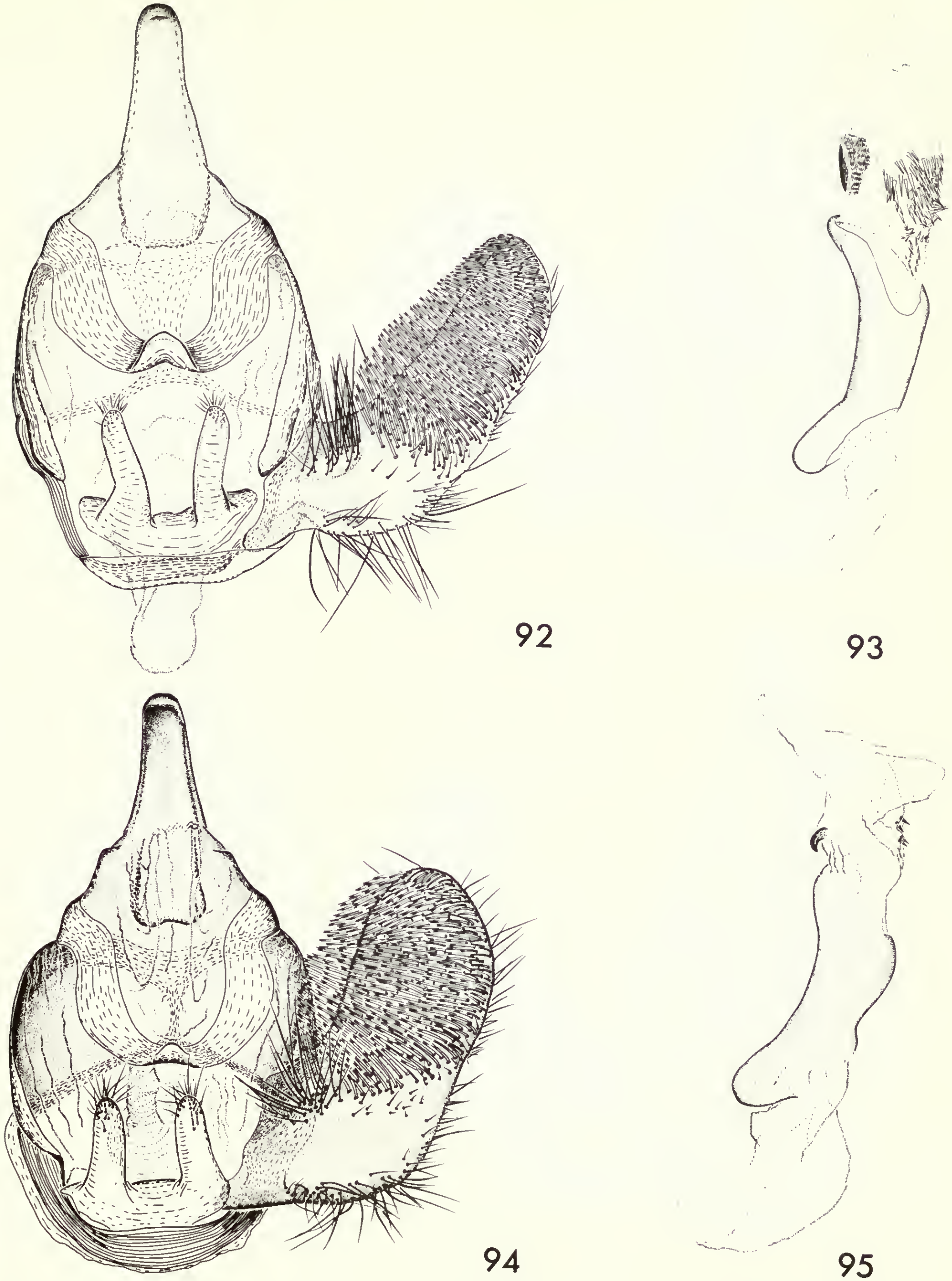
Figs 79–82 Genitalia of *Timocratica* ♂. 79, 80, *T. major* (Busck), Brazil. 81, 82, *T. agramma* sp. n., holotype, Brazil.



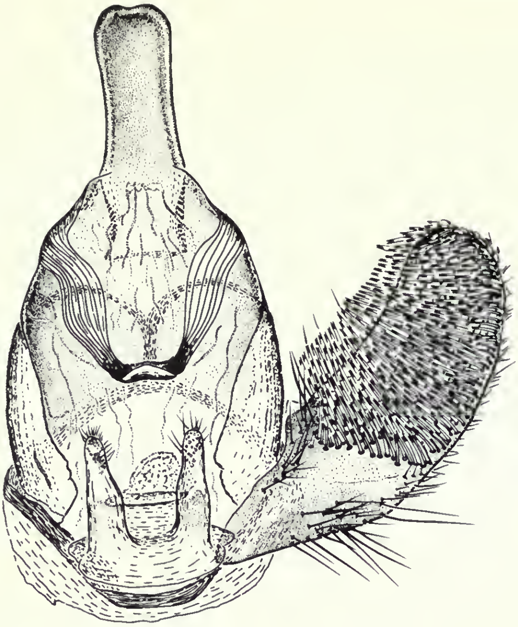
Figs 83–87 Genitalia of *Timocratica* ♂. 83–85, *T. longicilia* sp. n. (83, 84) paratype, Colombia. (85) right valva, paratype, Colombia. 86, 87, *T. pompeiana* Meyrick, Peru.



Figs 88–91 Genitalia of *Timocratica monotonia* (Strand), ♂. 88, 89, Colombia. 90, 91, Brazil.



Figs 92–95 Genitalia of *Timocratica* ♂. 92, 93, *T. monotonia* (Strand), Venezuela. 94, 95, *T. meridionalis* sp. n., paratype, Brazil.



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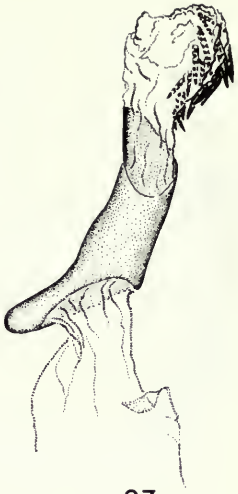

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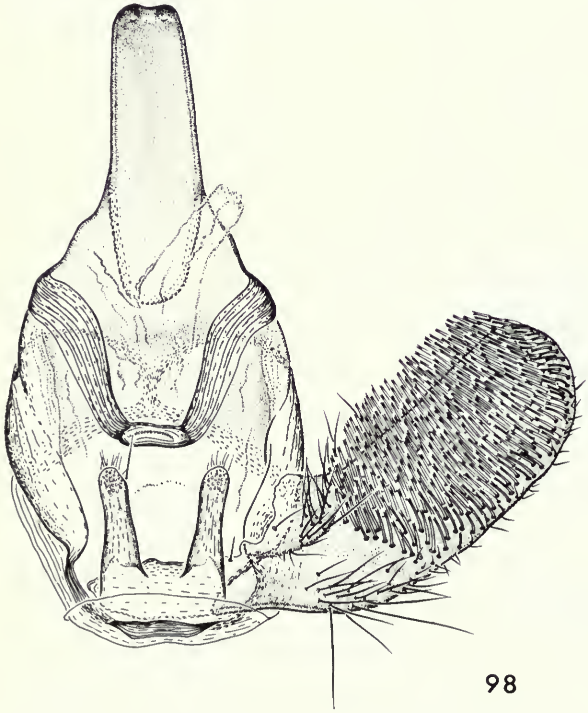

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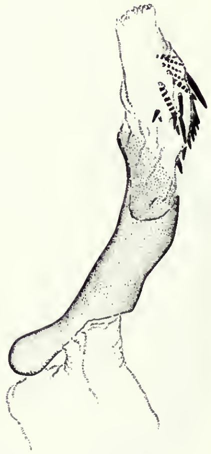

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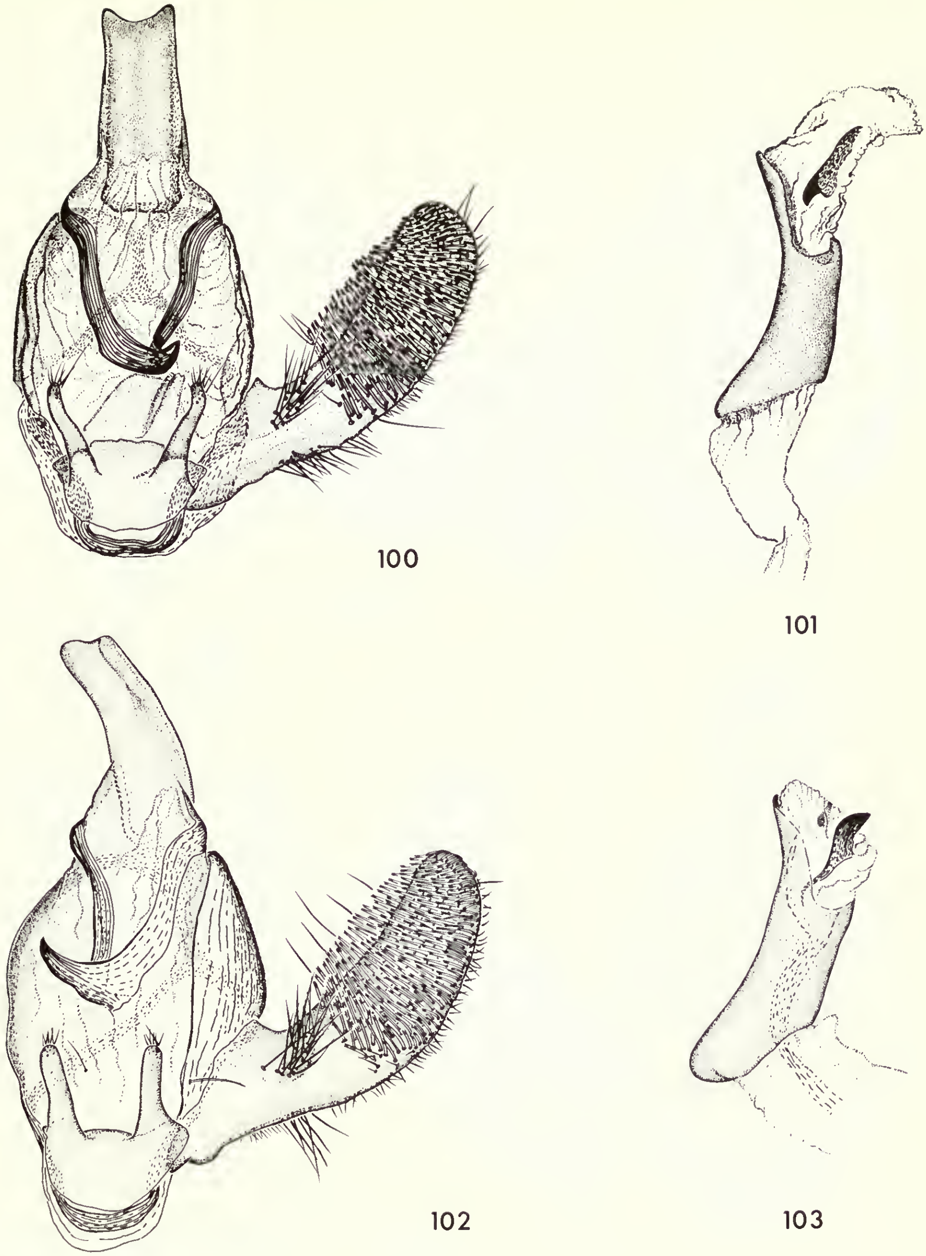

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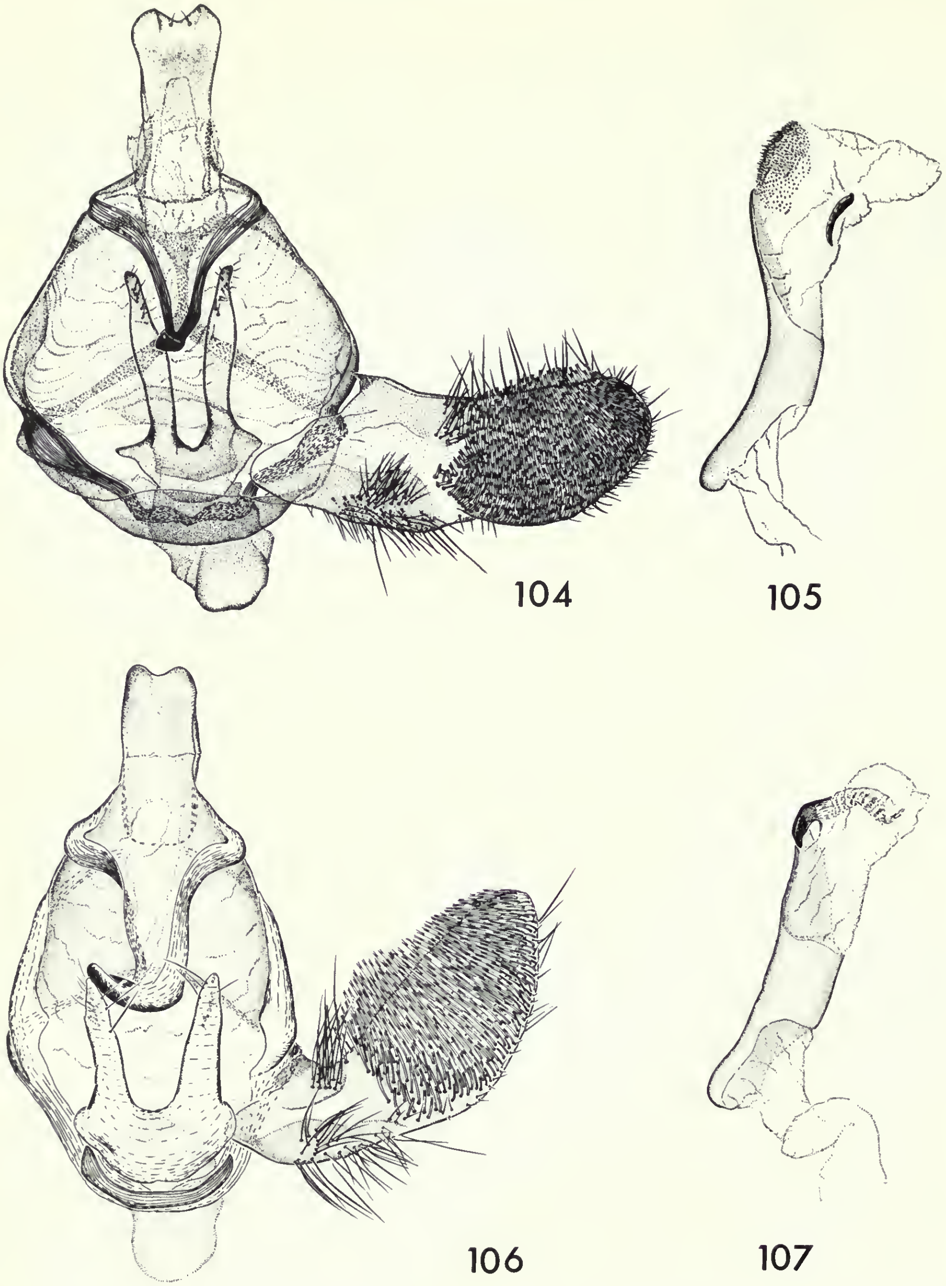
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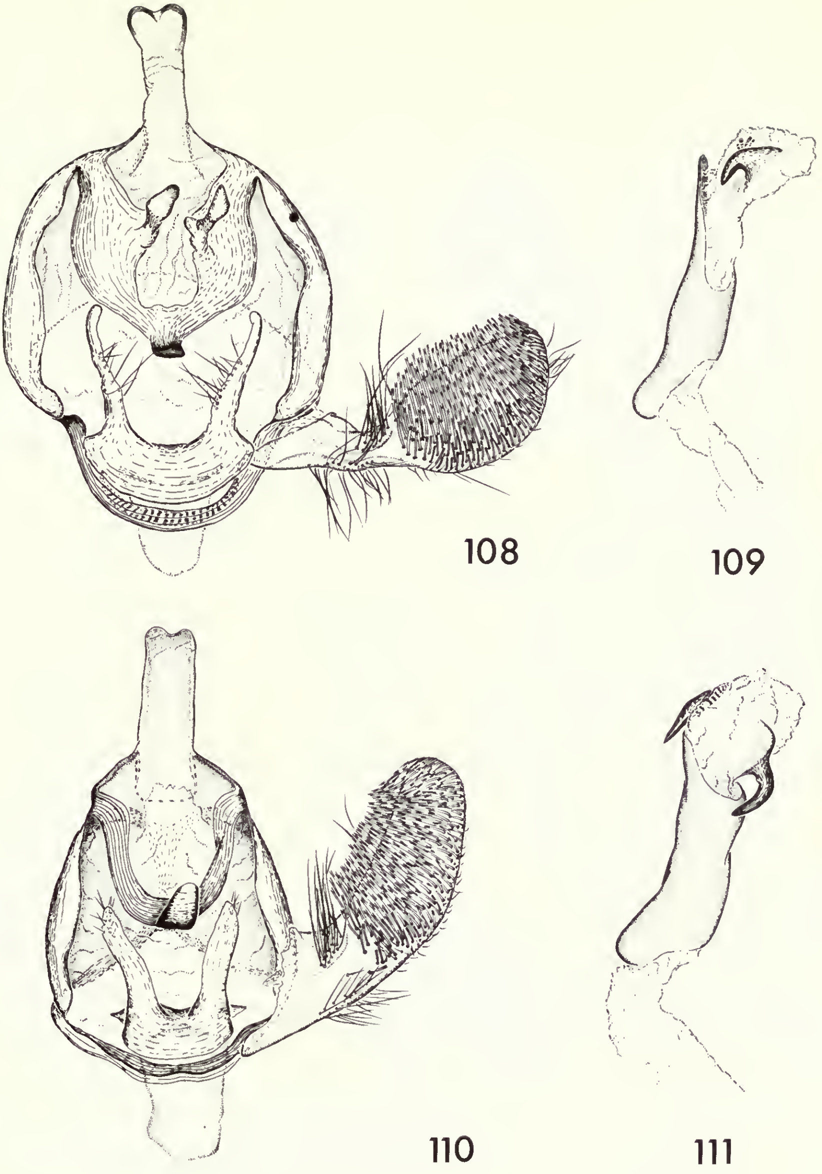

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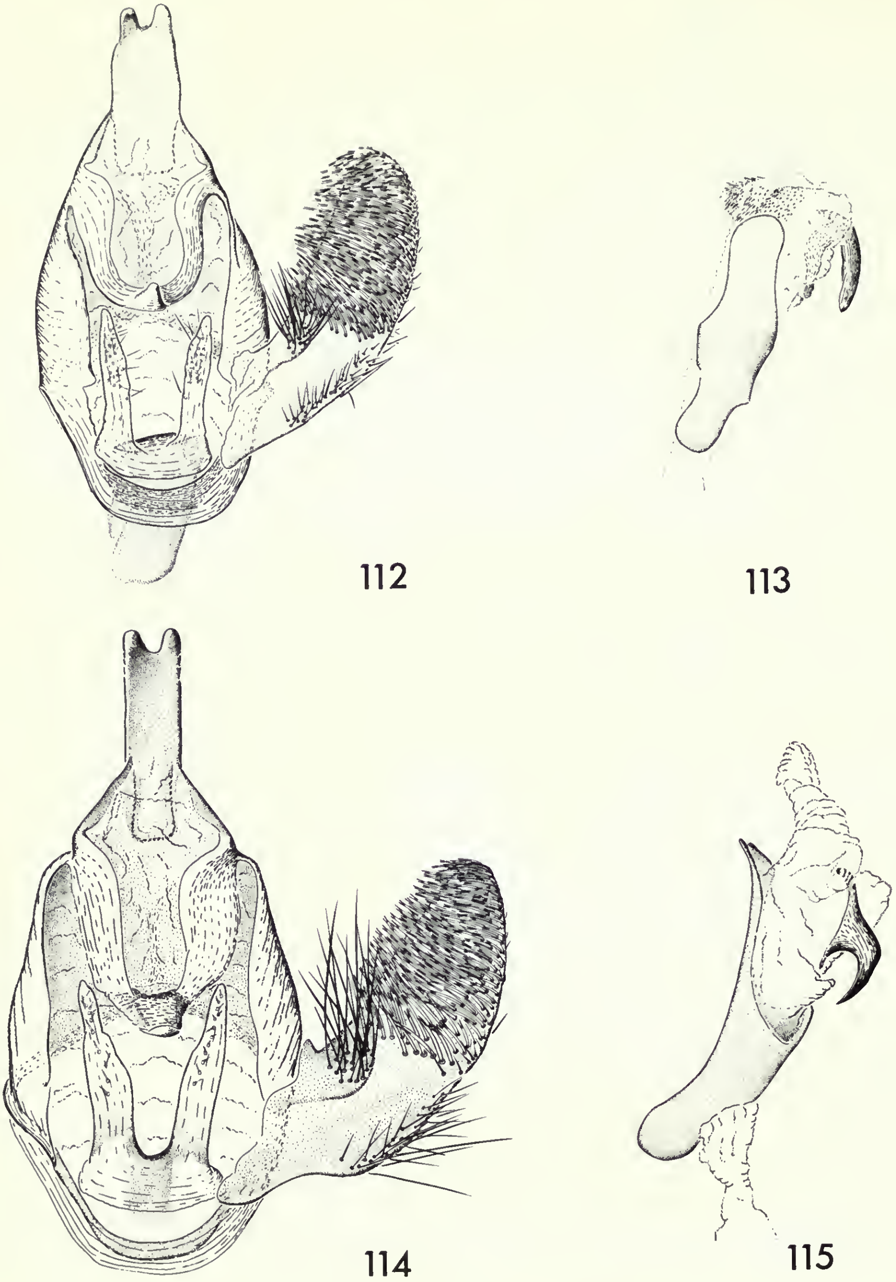

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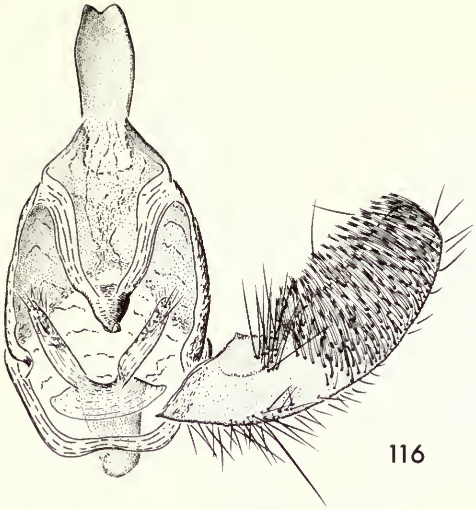

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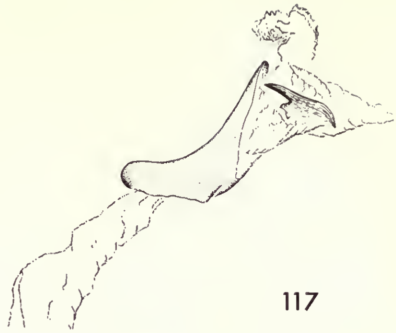

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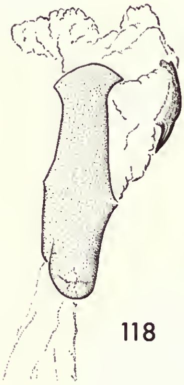

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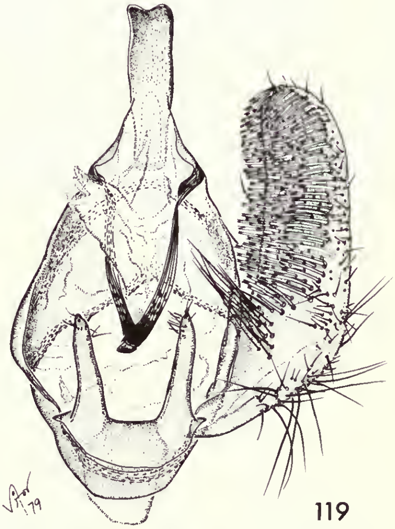

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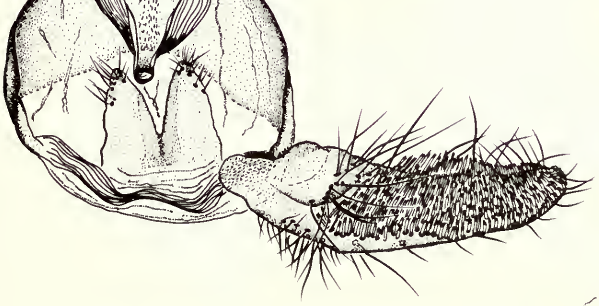

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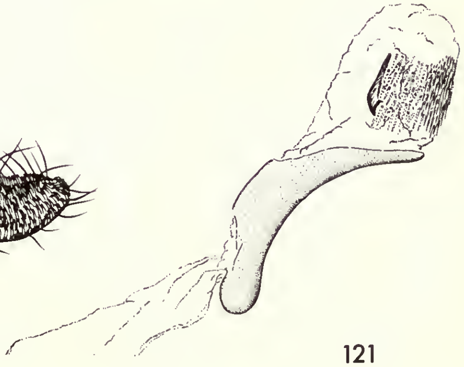

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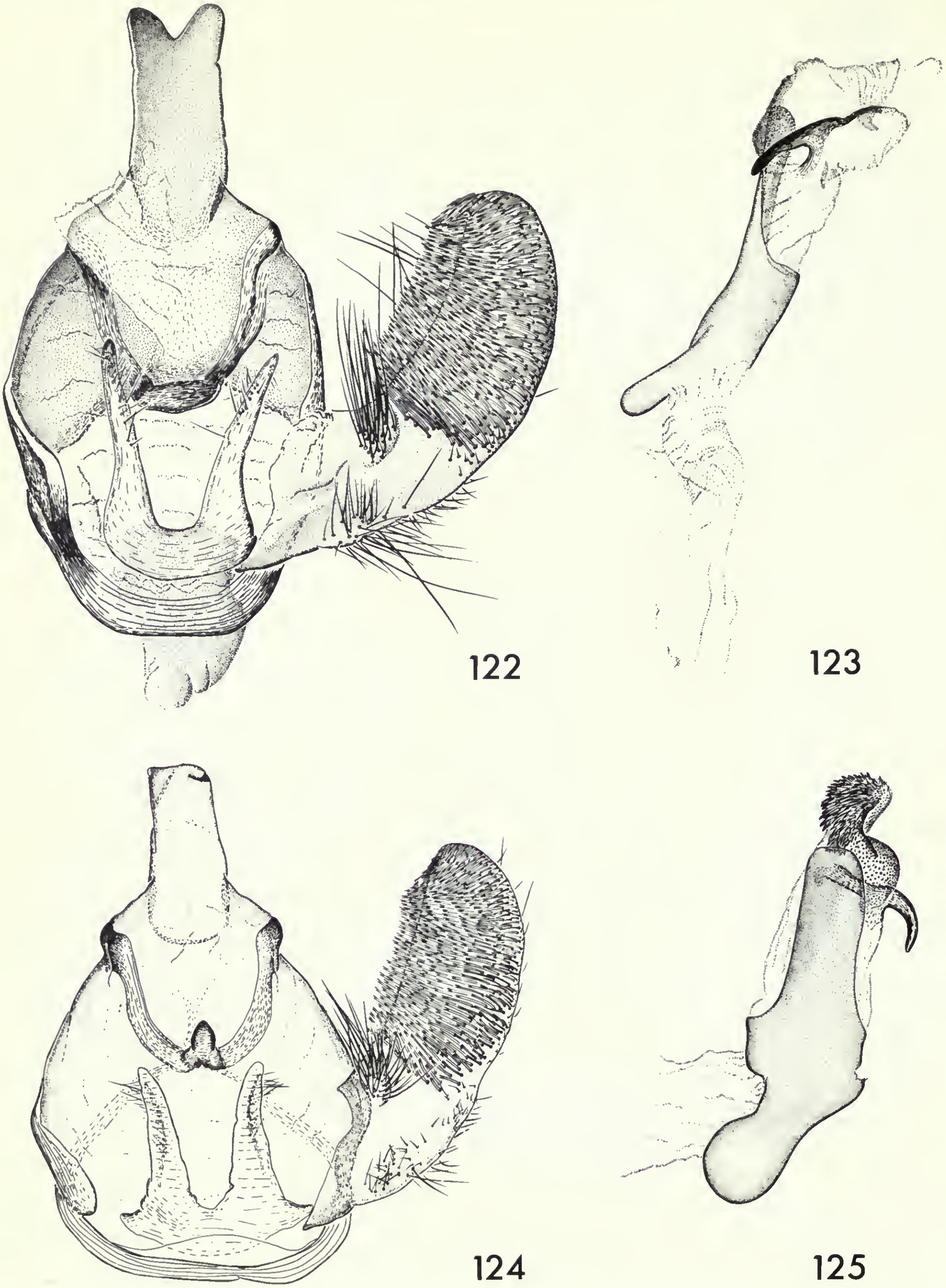
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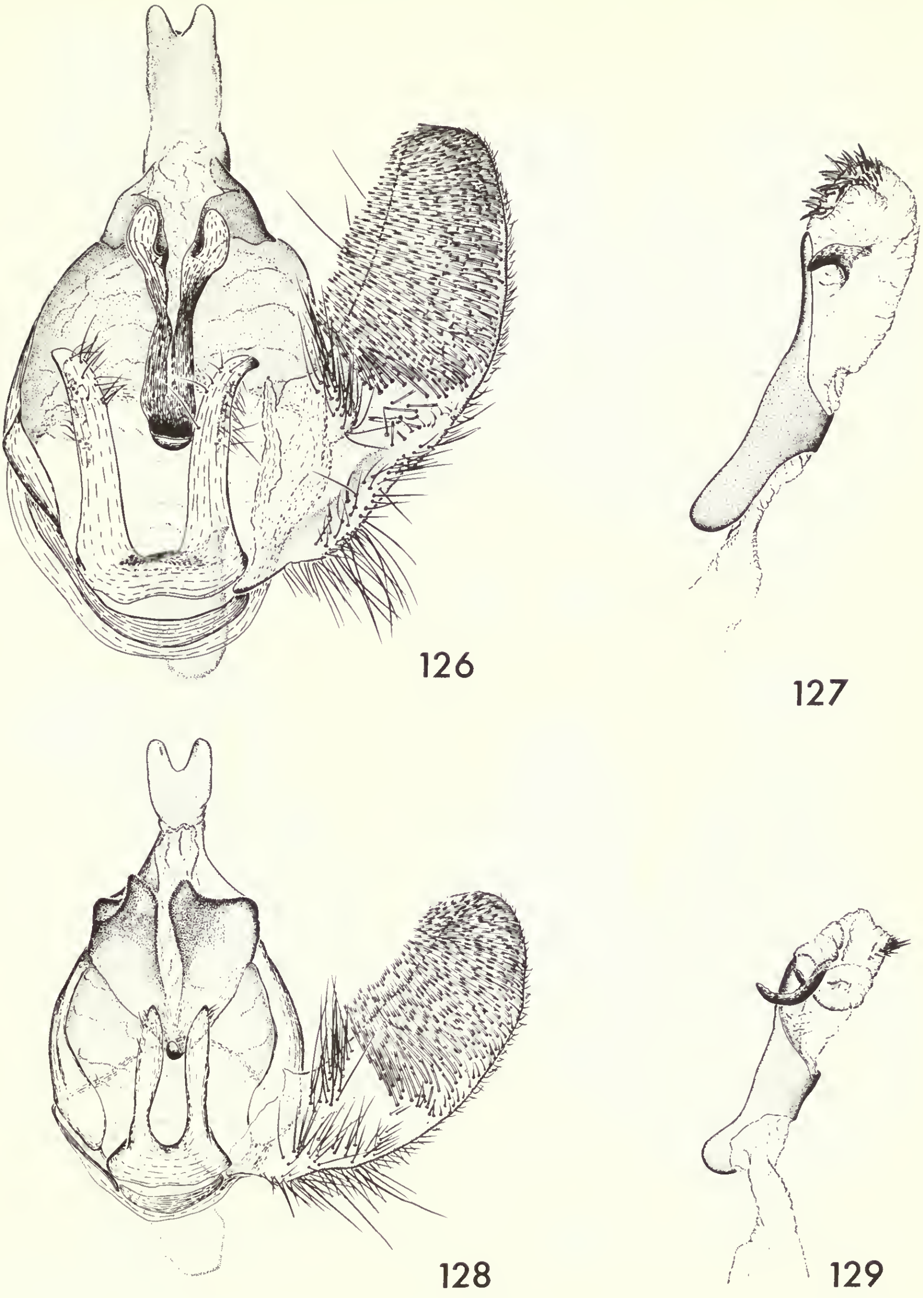

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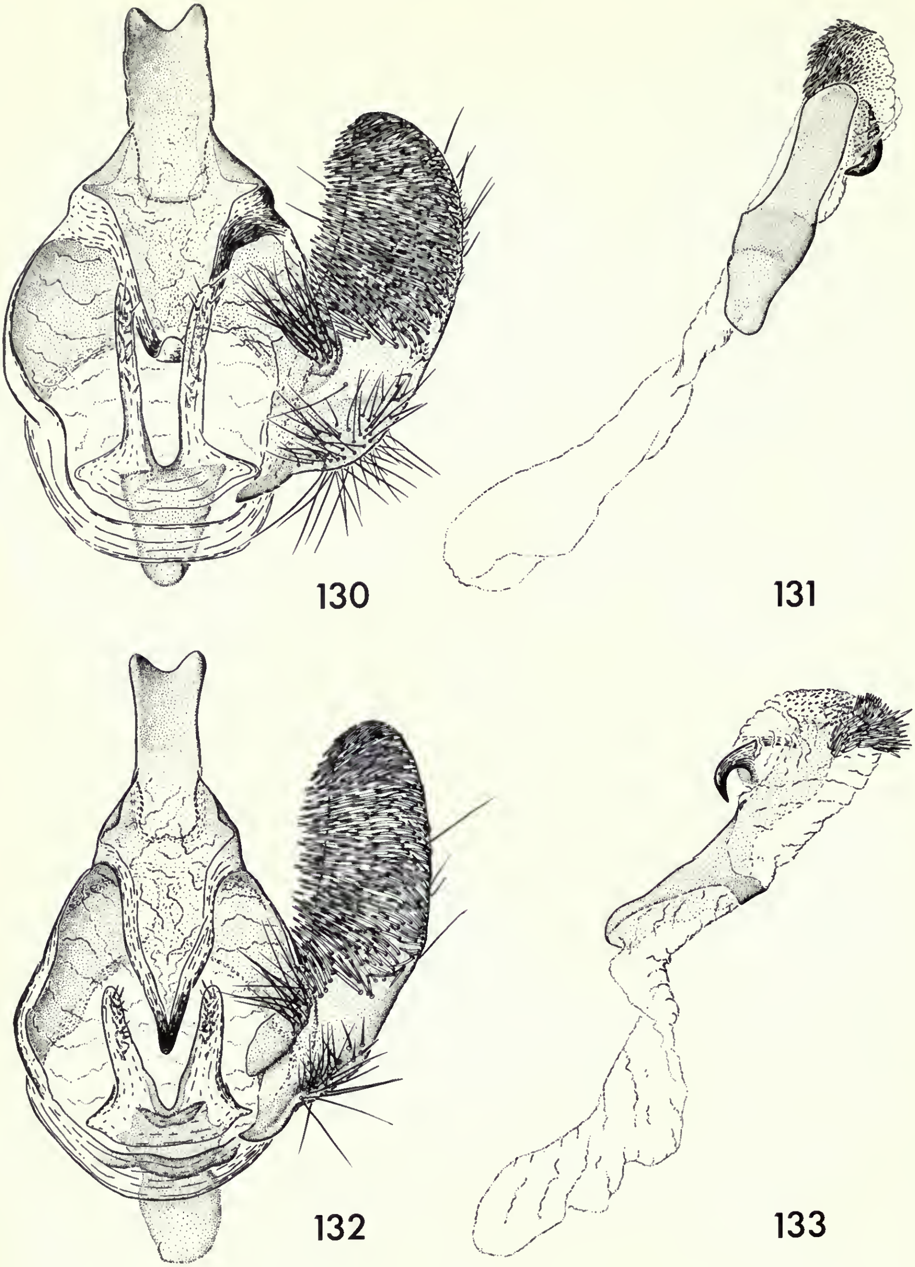
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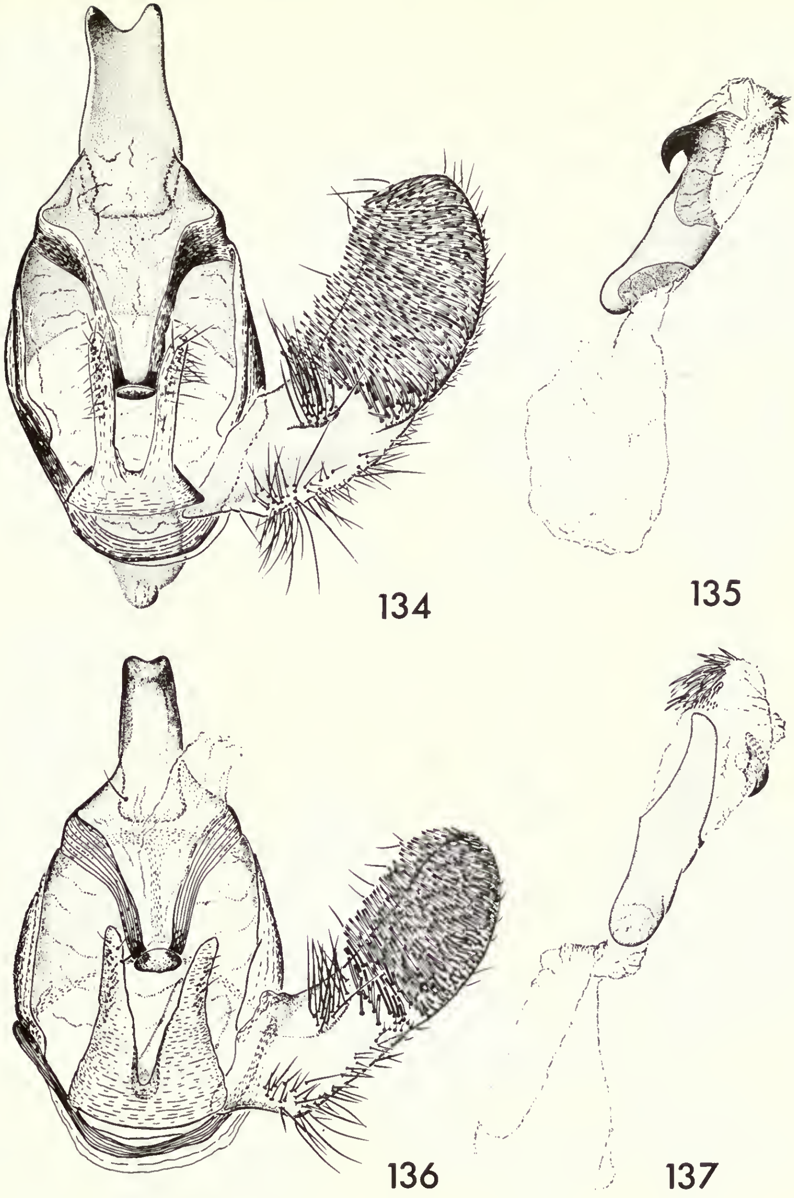

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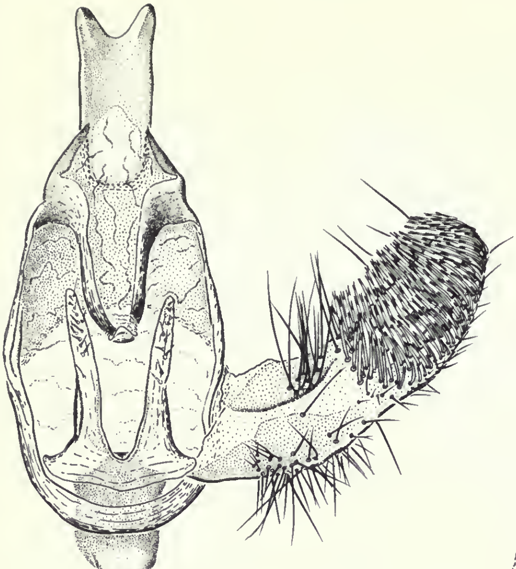

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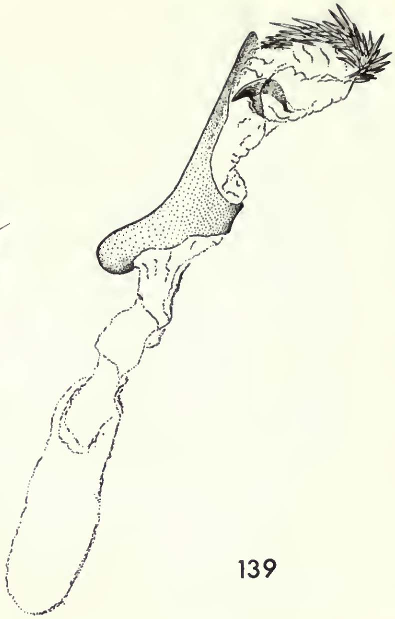

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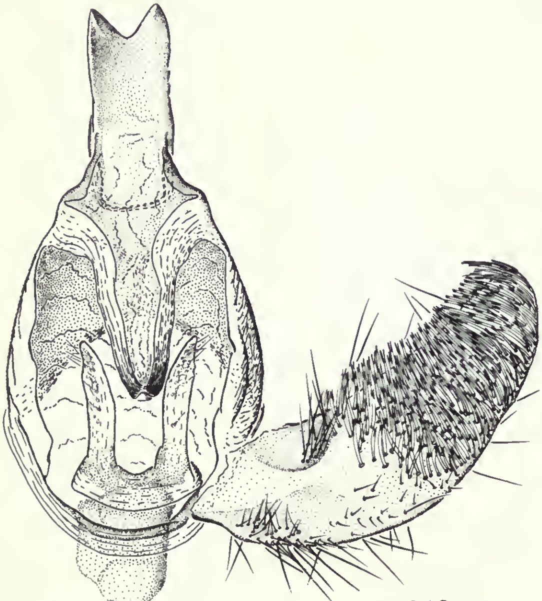

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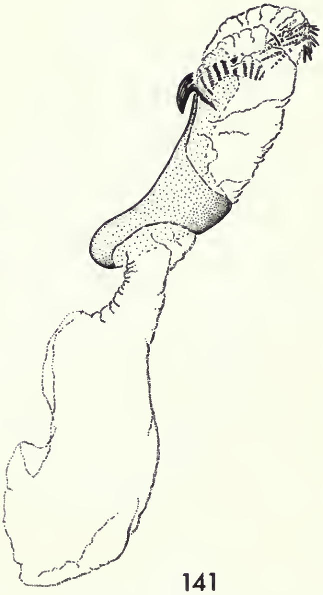

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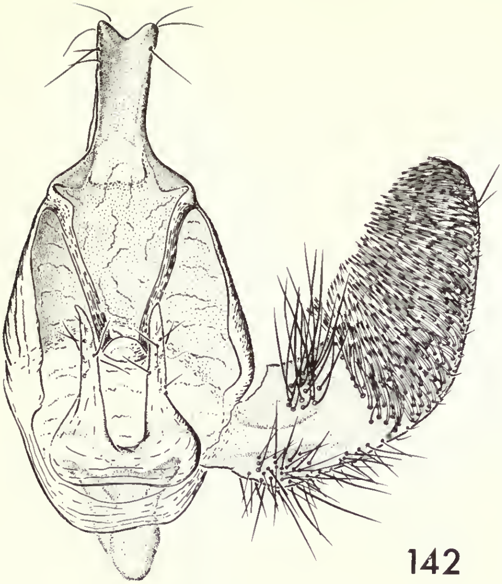

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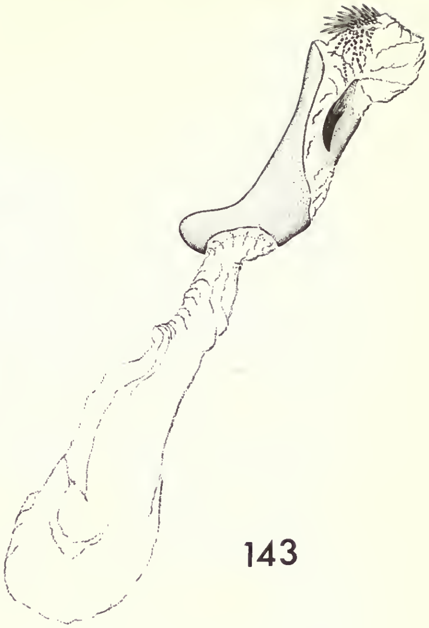

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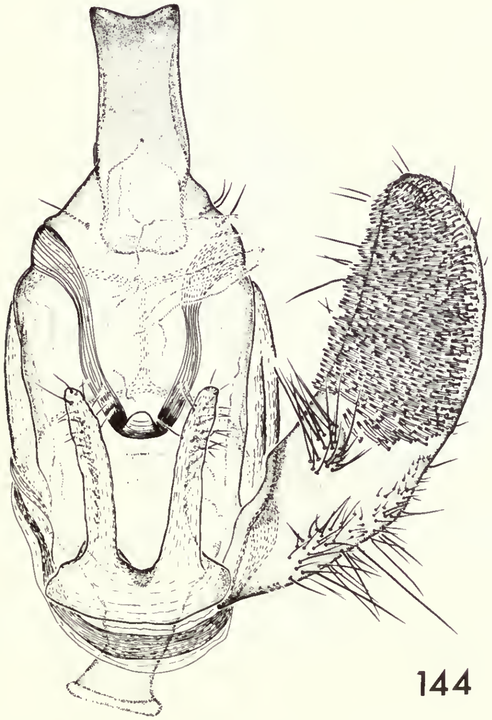

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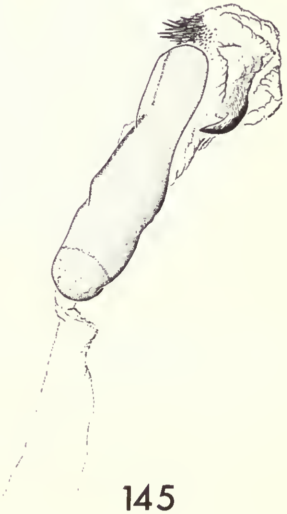

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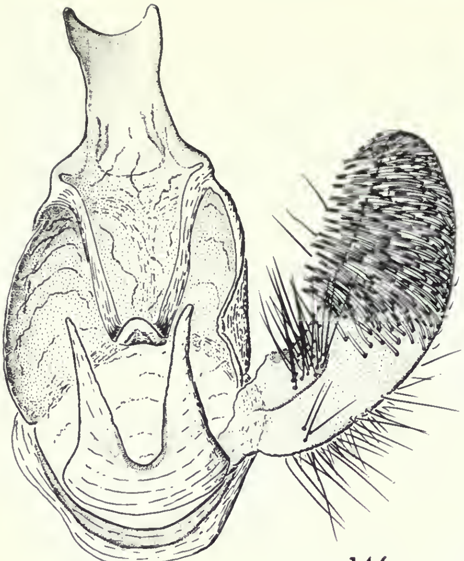

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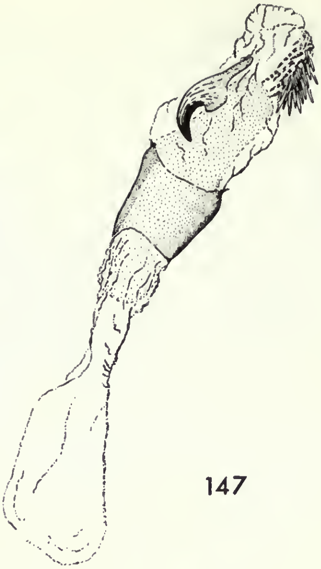

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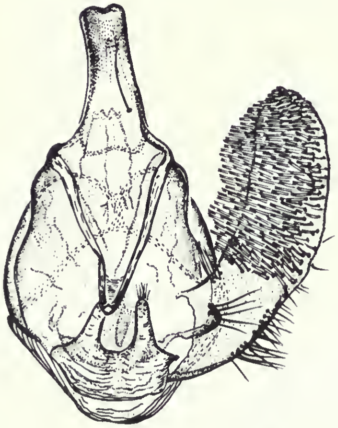

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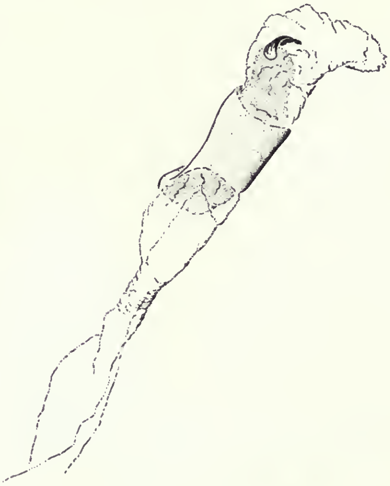

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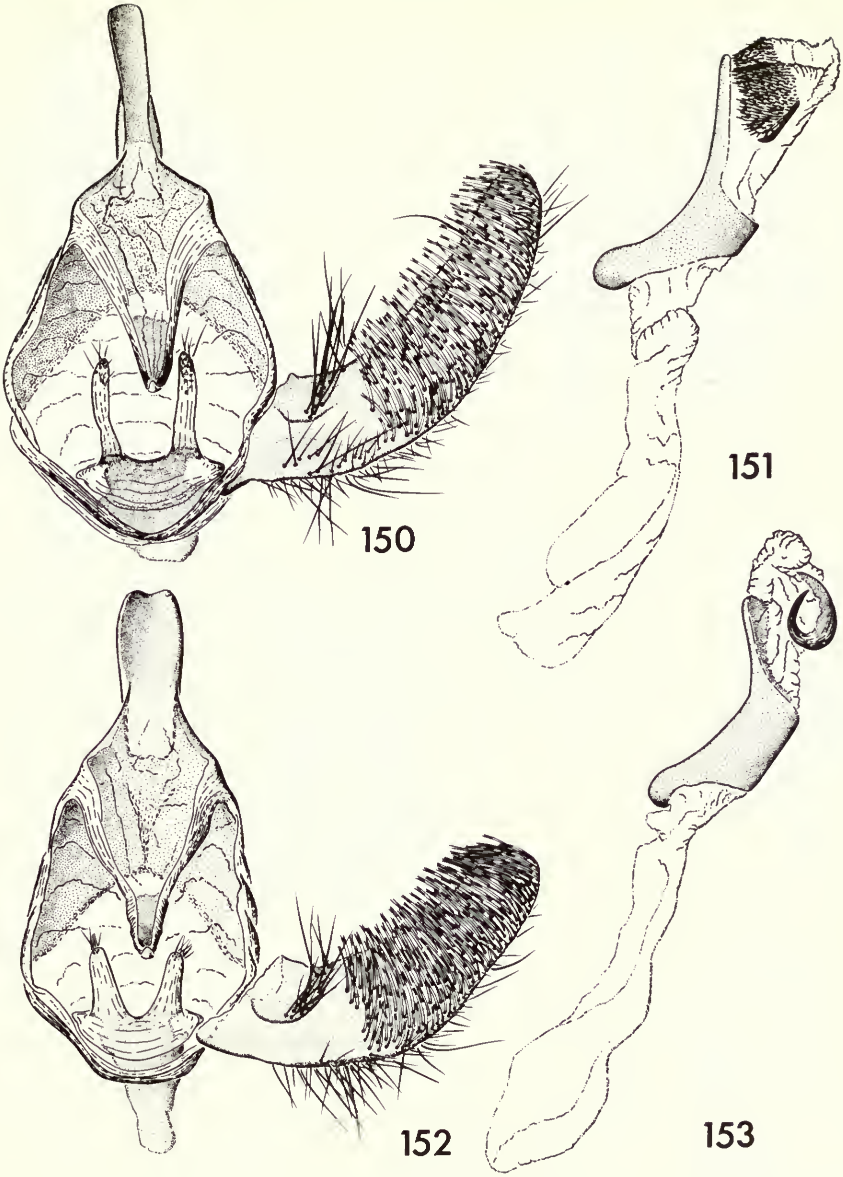

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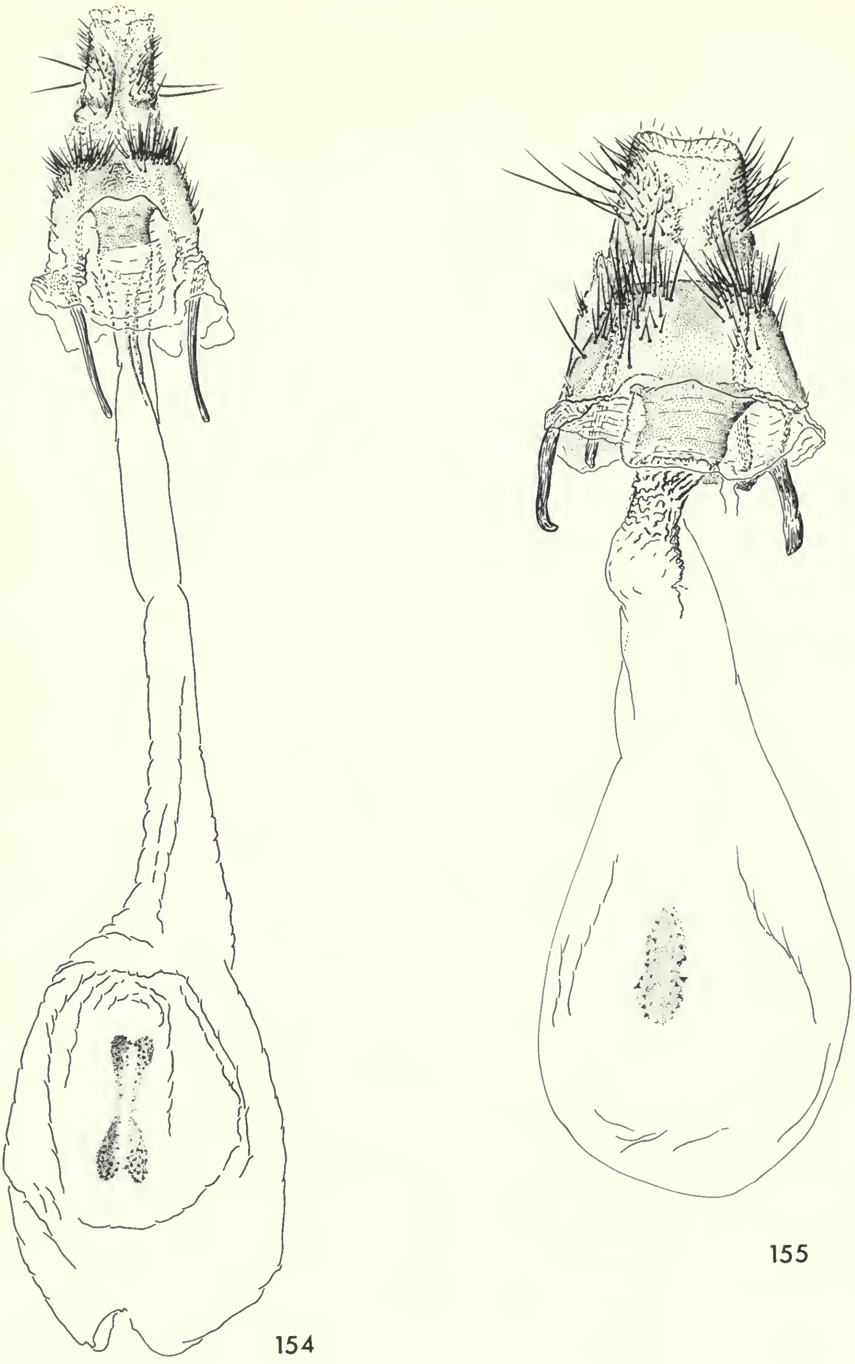

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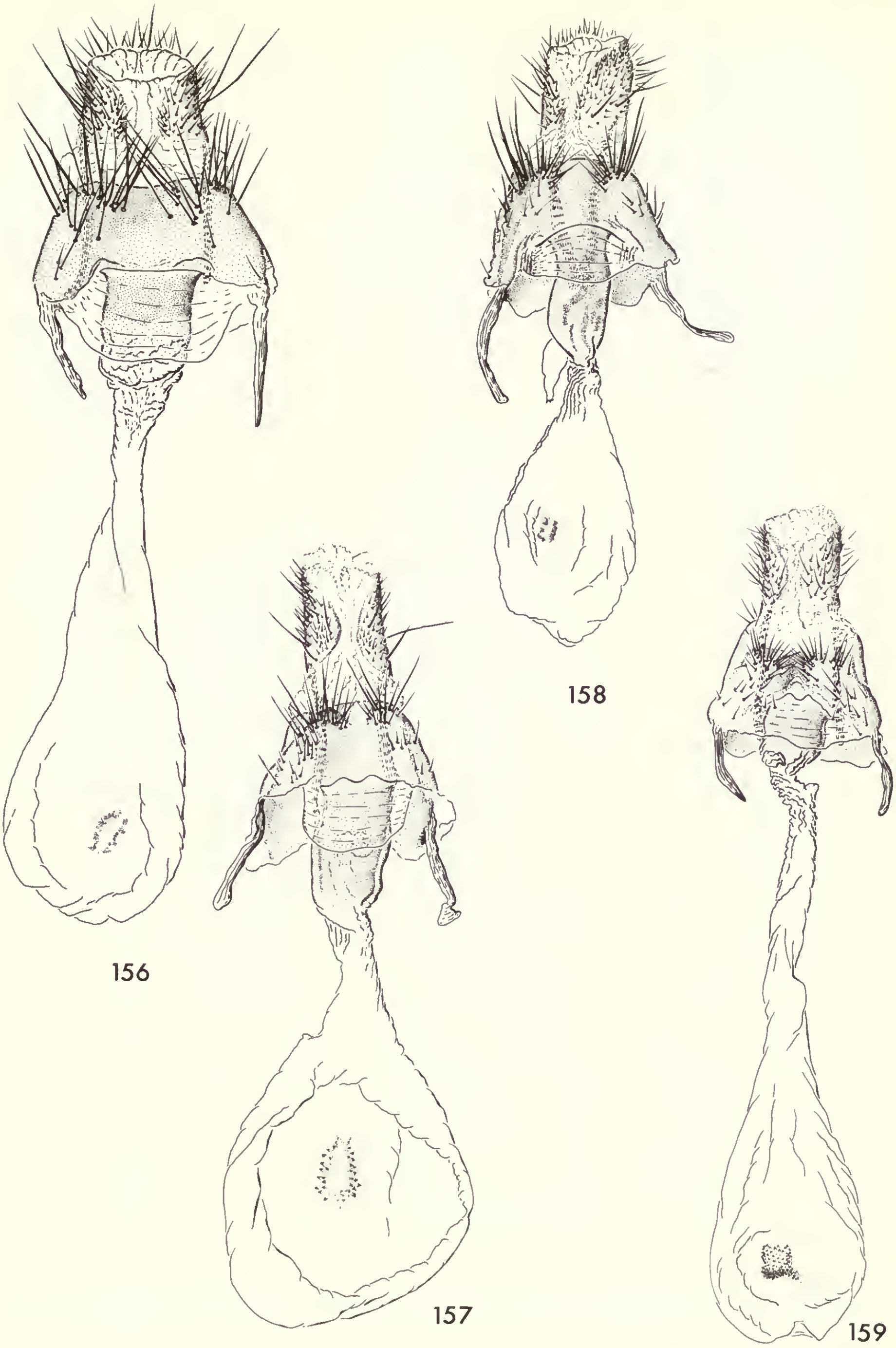

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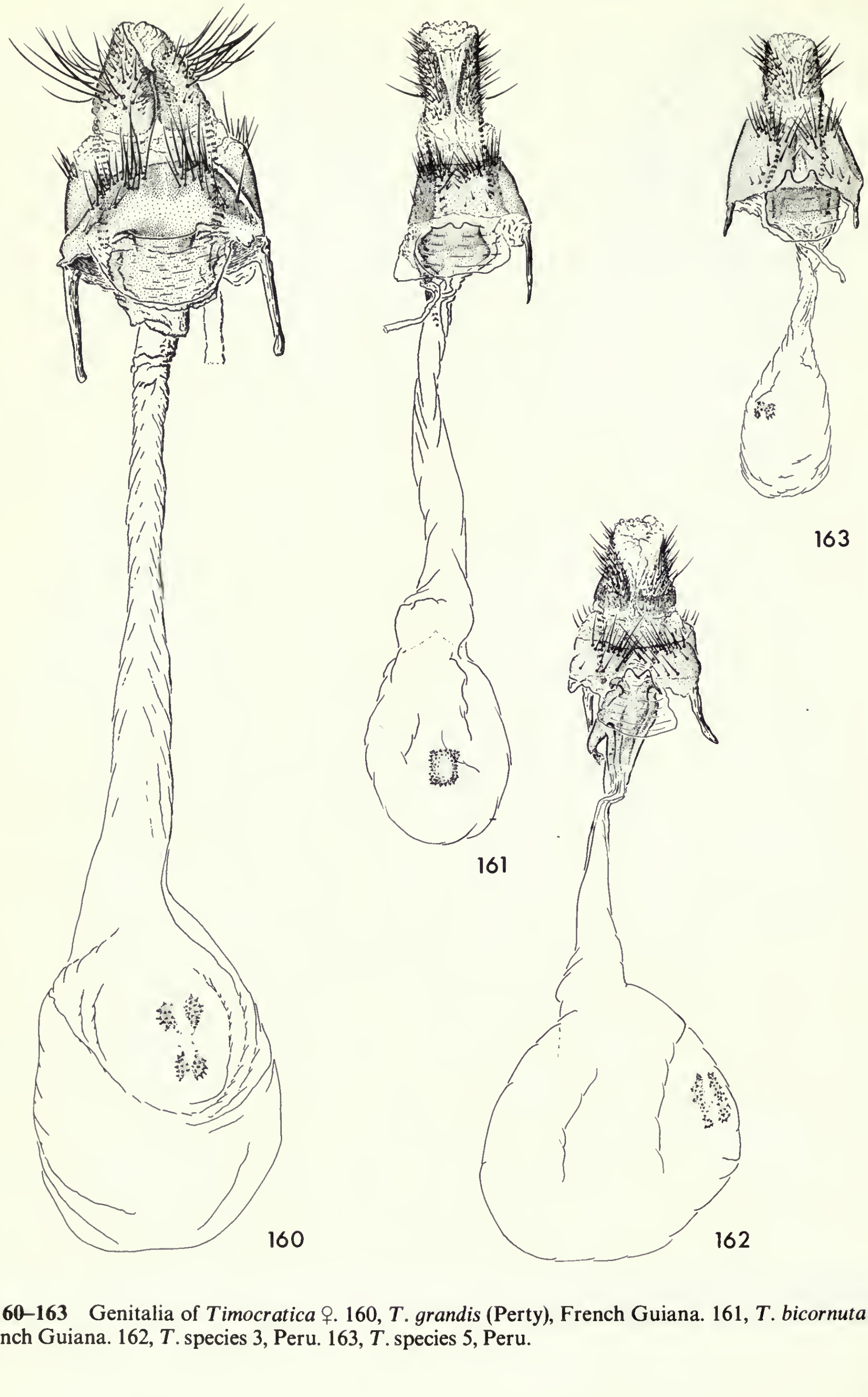

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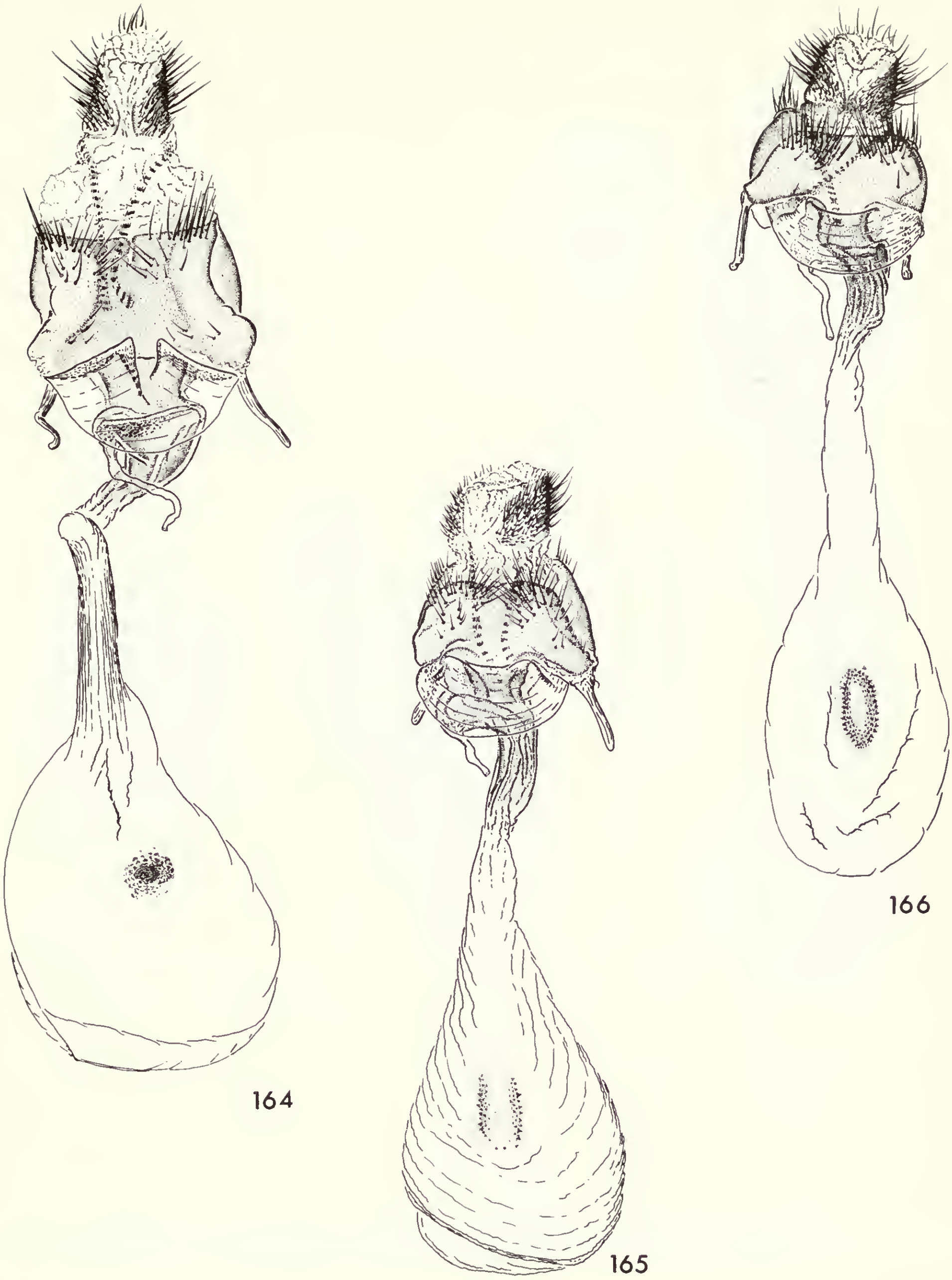

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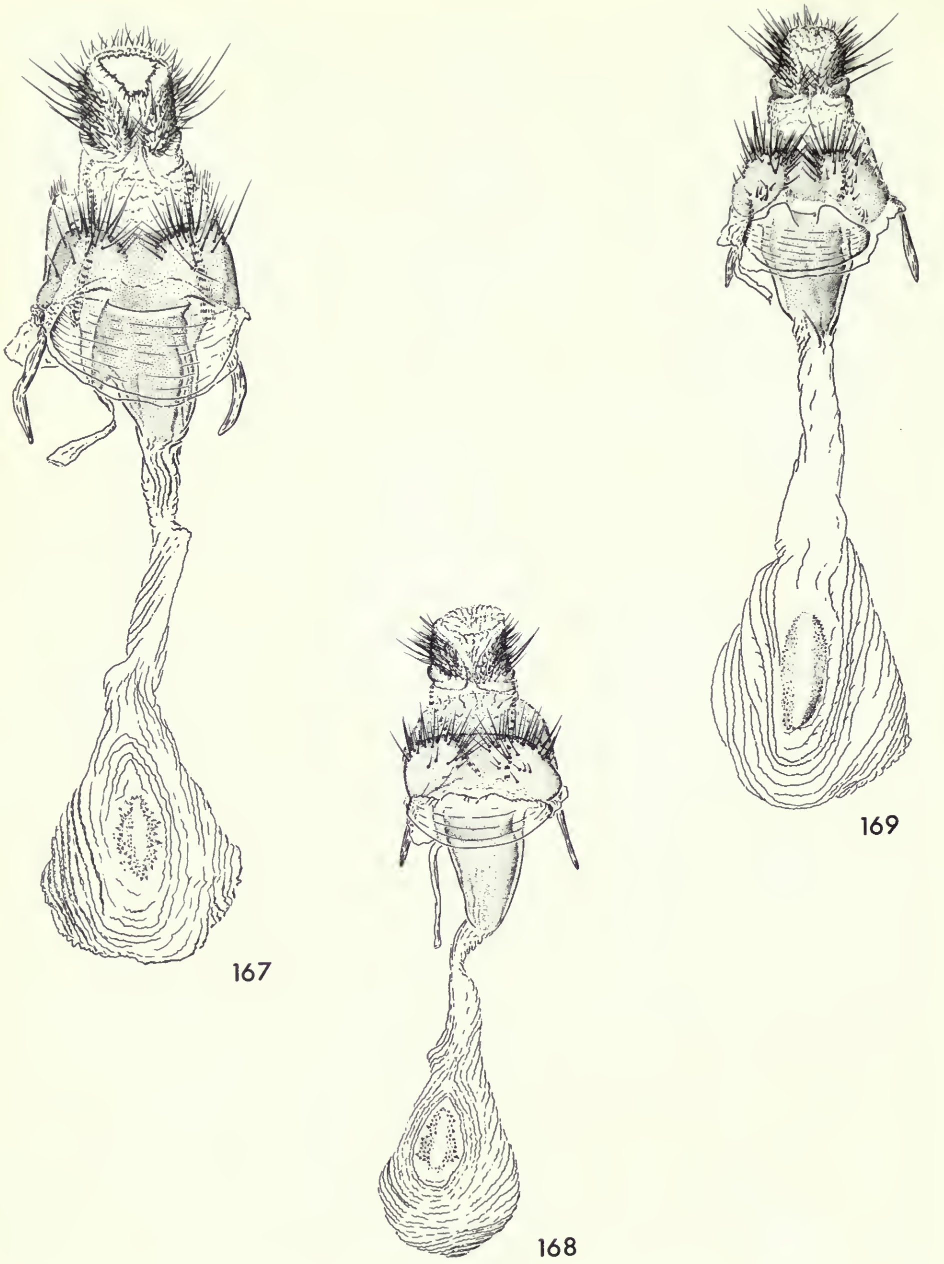

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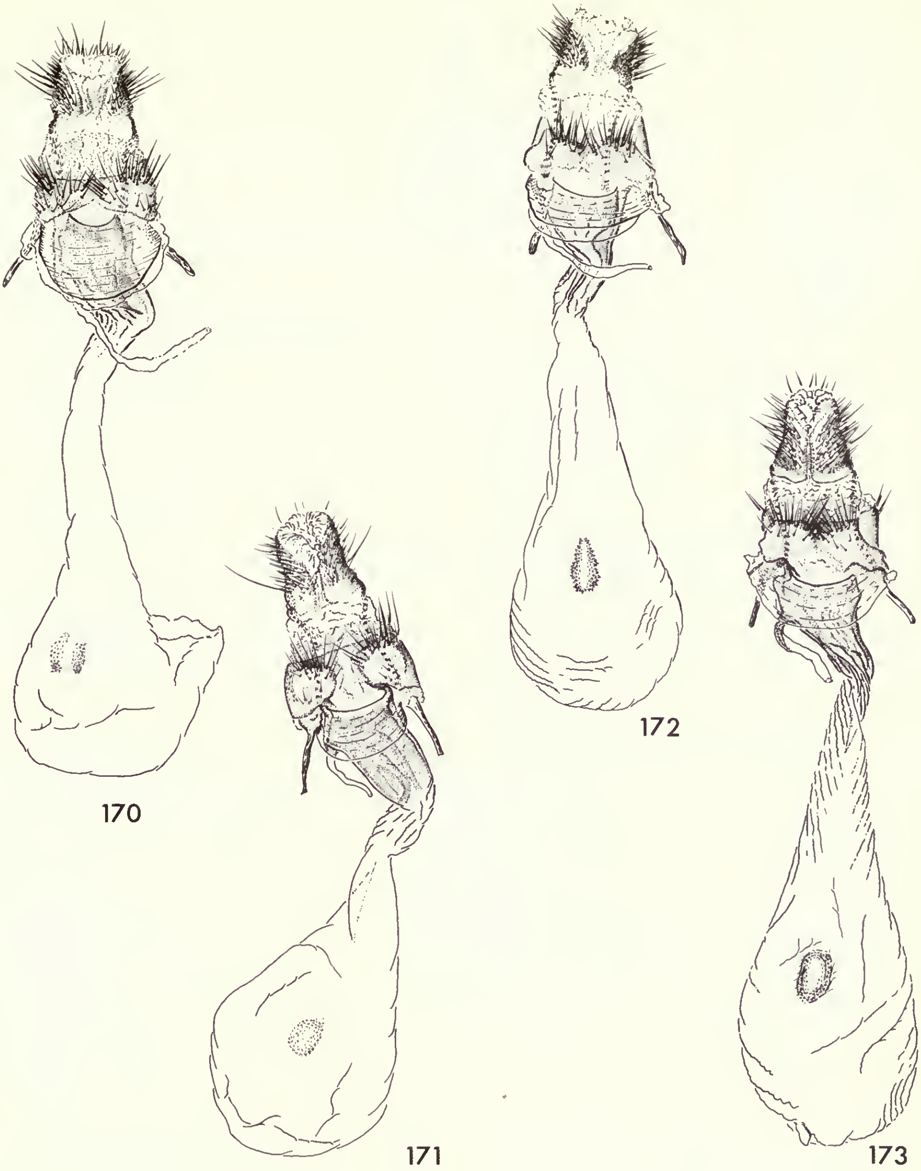

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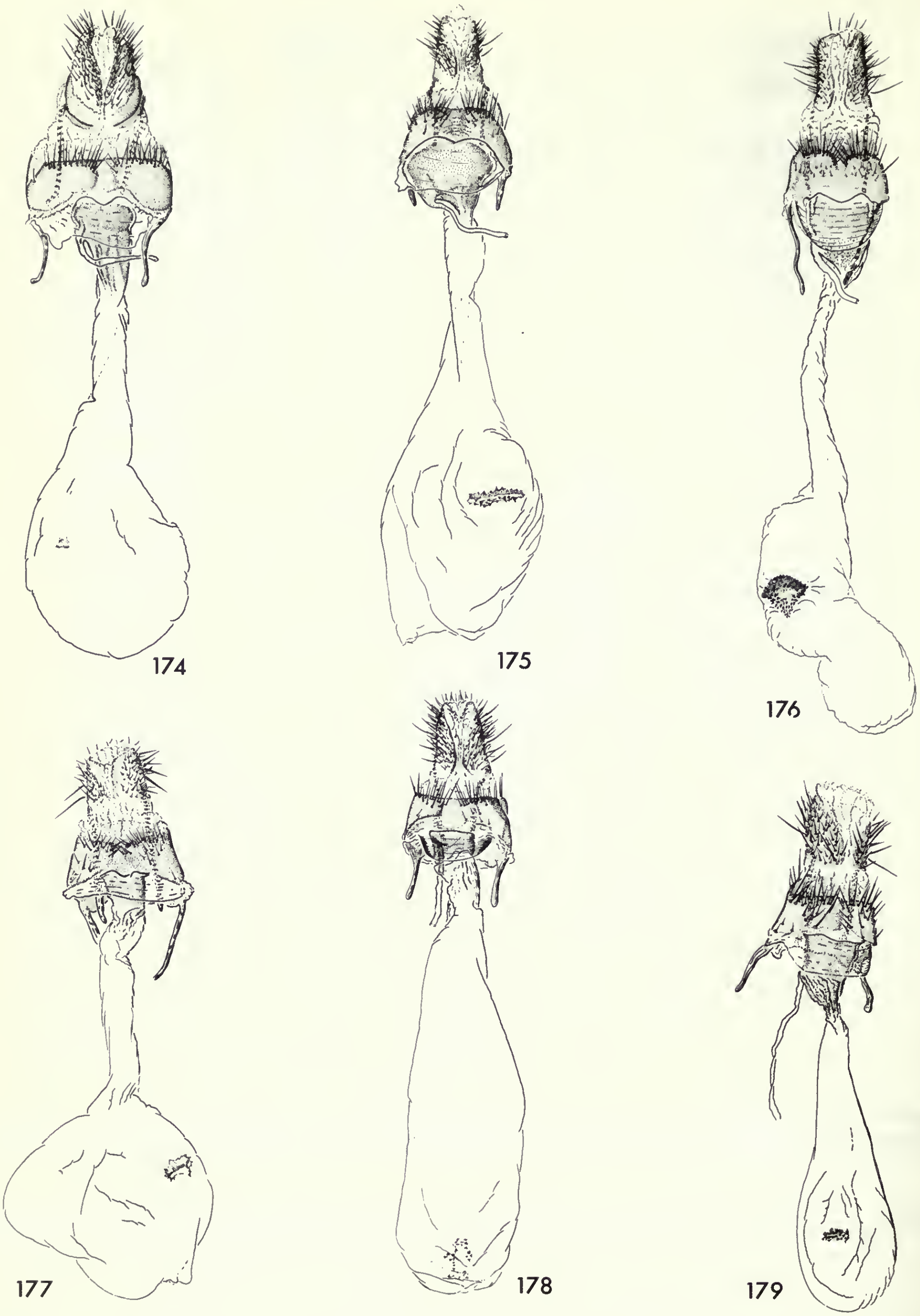

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Synopsis

The Afrotropical species of the myrmicine ant genera *Cardiocondyla* Emery, *Leptothorax* Mayr, *Melissotarsus* Emery and *Messor* Forel are revised and keyed, and a revised key to *Cataulacus* F. Smith is presented. At genus-level *Loncyda* Santschi, *Dyclona* Santschi and *Prosopidris* Wheeler are newly synonymized with *Cardiocondyla*; *Nesomyrmex* Wheeler and *Tetramyrma* Forel with *Leptothorax*; and *Veromessor* with *Messor*. The current synonymy of *Aphaenogaster* Mayr, a genus very close to *Messor*, is listed with the inclusion of *Brunella* Forel as a new synonym. At species-level nine *Cardiocondyla* (four new), 11 *Leptothorax* (one new), three *Melissotarsus* and 12 *Messor* (one new) are recognised in the regional fauna. New species-level synonymy includes 10 names in *Cardiocondyla*, three in *Leptothorax*, four in *Melissotarsus* and 14 in *Messor*, most of the last being of former infraspecific names. Five former infraspecific names in *Messor* are given new status here as valid species. In *Cataulacus* six new species are described and four previously synonymized names are reinstated as valid species.

Introduction

This paper is presented as a further contribution towards a revision of the subfamily Myrmicinae in the Afrotropical region which, for the purpose of this study, excludes the fauna of the Malagasy region. Previously issued parts of this series include studies of the genera *Epitritus* Emery (Bolton, 1972), *Cataulacus* F. Smith (Bolton, 1974), *Decamorium* Forel, *Rhoptromyrmex* Mayr and *Triglyphothrix* Forel (Bolton, 1976), *Tetramorium* Mayr (Bolton, 1980), *Meranoplus* F. Smith,

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Dicroaspis Emery and *Calyptomyrmex* Emery (Bolton, 1981*a*), *Ankylomyrma* Bolton, *Atopomyrmex* André, *Baracidris* Bolton, *Cyphoidris* Weber, *Ocymyrmex* Emery, *Pristomyrmex* Mayr and *Terataner* Emery (Bolton, 1981*b*).

With the inclusion of the four genera treated in this paper a total of 20 of the region's 43 presently recognized myrmicine genera have been revised in the present series. The Afrotropical fauna of some myrmicine genera has been studied by Brown who, beside revising *Rhoptromyrmex* (Brown, 1964), has also analysed the genera of the myrmicine tribe Dacetini and revised its main genera on a world-wide basis. In the case of sub-Saharan Africa this included the genera *Serrastruma* Brown (Brown, 1952), *Smithistruma* Brown (Brown, 1953) and *Strumigenys* F. Smith (Brown, 1954).

Prior to these studies very little synthesising work had been carried out on the Afrotropical myrmicines, the only notable contributions being the series of papers produced by Arnold between 1916 and 1926 on the fauna of South Africa, and a catalogue of species by Wheeler (1922) who also included a key to world genera. This key is now very much out of date, is difficult to use and cannot be trusted. Similarly Arnold's (1916) key to the South African myrmicine genera has, through subsequent synonymies and descriptions of new genera, become unusable. More recently Bolton (1973) presented a subfamilial and generic key for the Afrotropical region but again detailed investigation of the individual genera mentioned above has already rendered this partially obsolete. A key to the 19 myrmicine genera in which the antennal club is restricted to two segments has been constructed by Bolton (1981*b*) and a key to the remaining genera is presently being built up.

The four genera newly revised in this paper, which are discussed in more detail under their individual sections, constitute a relatively minor proportion of the regional fauna in terms of number of species. *Melissotarsus* and *Cardiocondyla* are arbitrarily regarded as small genera, with three and nine species respectively in the region, whilst *Leptothorax* with 11 and *Messor* with 12 species are of moderate size. Apart from *Melissotarsus*, which is restricted to sub-Saharan Africa and Madagascar, most species of the other three genera are primarily distributed elsewhere, the Afrotropical fauna merely representing the few species which have successfully invaded the region from the north.

Measurements and indices

Total Length (TL). The total outstretched length of the individual, from mandibular apex to gastral apex.

Head Length (HL). The length of the head proper, excluding the mandibles, measured in a straight line from the anteriormost point of the median clypeal margin to the mid-point of the occipital margin, in full-face view. (In species with strongly concave occipital margin the head length is measured to the mid-point of a line connecting the posterolateral corners.)

Head Width (HW). The maximum width of the head in full-face view, measured behind the eyes.

Cephalic Index (CI). $\frac{\mathrm{HW} \times 100}{\mathrm{HL}}$

Eye Length (EL). In *Cataulacus*; the maximum length of the eye in full-face view.

Ocular Index (OI). In *Cataulacus*; $\frac{\mathrm{EL} \times 100}{\mathrm{HW}}$

Scape Length (SL). The maximum straight-line length of the antennal scape excluding the basal constriction or neck. (In *Cataulacus* the SL usually measured in profile view with the scape in its scrobe, as it is usually in this position in mounted specimens.)

Scape Index (SI). $\frac{\mathrm{SL} \times 100}{\mathrm{HW}}$

Pronotal Width (PW). The maximum width of the pronotum in dorsal view.

Alitrunk Length (AL). The diagonal length of the alitrunk in profile from the point at which the pronotum meets the cervical shield to the posterior base of the metapleural lobes or teeth. (In *Melissotarsus* measured to posteroventral corner of alitrunk as metapleural lobes absent.)

Abbreviations of museums

AMNH, New York	American Museum of Natural History, New York, U.S.A.
BMNH	British Museum (Natural History), London, U.K.
IE, Bologna	Istituto di Entomologia del'Università, Bologna, Italy.
MCSN, Genoa	Museo Civico di Storia Naturale 'Giacomo Doria', Genoa, Italy.
MCZ, Cambridge	Museum of Comparative Zoology, Cambridge, Massachusetts, U.S.A.
MHN, Geneva	Muséum d'Histoire Naturelle, Geneva, Switzerland.
MNHN, Paris	Muséum National d'Histoire Naturelle, Paris, France.
MNHU, Berlin	Museum für Naturkunde der Humboldt-Universität, Berlin, Germany (D.D.R.).
MRAC, Tervuren	Musée Royal de l'Afrique Centrale, Tervuren, Belgium.
NM, Basle	Naturhistorisches Museum, Basle, Switzerland.
NM, Bulawayo	National Museum, Bulawayo, Zimbabwe. (Hymenoptera from this museum are now deposited in SAM, Cape Town.)
NM, Vienna	Naturhistorisches Museum, Vienna, Austria.
SAM, Cape Town	South African Museum, Cape Town, South Africa.
USNM, Washington	United States National Museum, Washington, D.C., U.S.A.
ZM, Kiev	Zoological Museum, Institute of Zoology, Academy of Sciences of Ukrainian S.S.R., Kiev, U.S.S.R.

CARDIOCONDYLA Emery

(Figs 1-7)

Cardiocondyla Emery, 1869: 20. Type-species: *Cardiocondyla elegans* Emery, 1869: 21, by monotypy.

Emeryia Forel, 1890: cx. Type-species: *Emeryia wroughtonii* Forel, 1890: cxi, by monotypy. [Synonymy by Forel, 1892: 313.]

Xenometra Emery, 1917: 96. Type-species: *Xenometra monilicornis* Emery, 1917: 96. (=*Cardiocondyla emeryi* Forel), by monotypy. [Synonymy by Urbani, 1973: 199.]

Loncyda Santschi, 1930: 70 [as subgenus of *Cardiocondyla*]. Type-species: *Cardiocondyla* (*Loncyda*) *monardi* Santschi, 1930: 70, by monotypy. **Syn. n.**

Dyclona Santschi, 1930: 70 [as subgenus of *Cardiocondyla*]. Type-species: *Monomorium cristatum* Santschi, 1912: 163, by original designation. **Syn. n.**

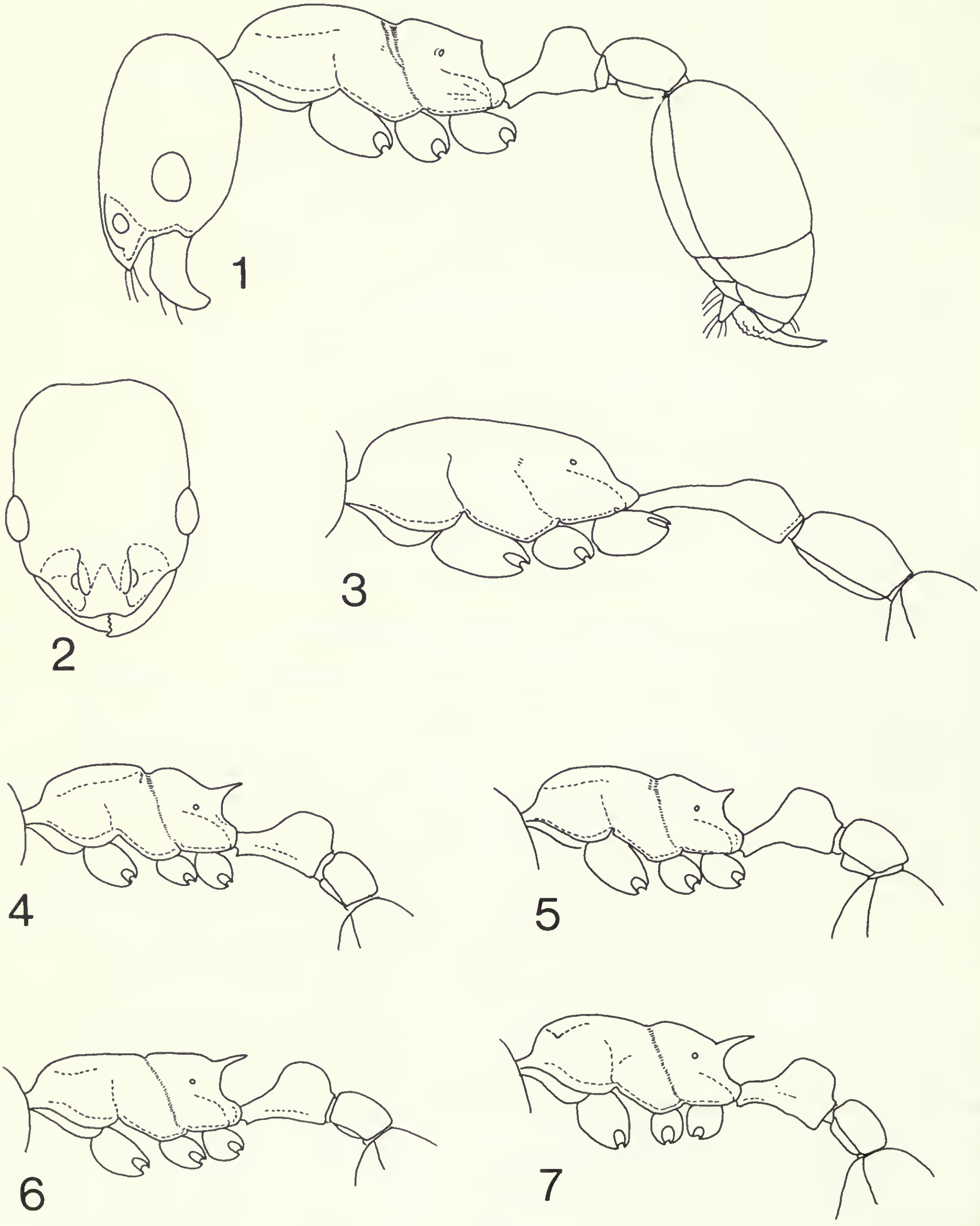
Prosopidris Wheeler, 1935: 40 [as subgenus of *Cardiocondyla*]. Type-species: *Cardiocondyla* (*Prosopidris*) *sima* Wheeler, 1935: 41, by original designation. **Syn. n.**

Prosopidris Wheeler; Reiskind, 1965: 80. [Raised to genus.]

DIAGNOSIS OF WORKER. Small to minute monomorphic myrmicine ants. Mandibles with 5 teeth which decrease in size from apical to basal. Palp formula 5, 3 (16 species examined). Clypeus with flattened and prominent projecting lateral portions which are fused to the raised projecting median portion to form a shelf which projects forward over the mandibles (Fig. 2). Sometimes the lateral portions of the clypeus extend further forward than the median so that the anterior margin of the projecting shelf is concave medially. Median portion of clypeus posteriorly broadly inserted between small narrow frontal lobes. Frontal carinae and antennal scrobes absent. Eyes present, generally large and conspicuous, situated in front of the midlength of the sides. Antennae with 11–12 segments, usually with a distinct 3-segmented club but the first club segment may be relatively small. Promesonotal dorsum flattened to evenly convex in profile, the dorsal alitrunk without sutures but the metanotal groove commonly (but by no means universally) impressed. Pronotal corners in dorsal view broadly rounded to bluntly angular and projecting. Propodeal spiracle small, situated approximately at the midlength, often low down on the side but not shifted back towards the margin of the declivity. Propodeum unarmed to strongly bispinose. Metapleural lobes low and rounded. Petiole nodiform with a moderate to long, usually slender, anterior peduncle. Postpetiole dorsoventrally flattened in profile, in dorsal view very broad, much broader than the petiole node. Sting large and strongly developed, knife blade-like and broad in profile, without lamelliform appendages. Dorsal surfaces of body usually hairless.

The genus *Cardiocondyla* contains about 40 species, mostly distributed in the Old World. Discounting tramp species only two have been described from the New World (*ectopia* Snelling and *venustula* Wheeler) but it is quite possible that both represent introductions, although to the present no conspecific forms have been found among Old World material of the genus.

Cardiocondyla contains several very successful tramp species which are easily and apparently frequently spread by human commerce. Such tramps include the cosmopolitan *emeryi*, tropicopolitan *wroughtonii* and the Pacific island-hopping *nuda* (Mayr), which sometimes reaches



Figs 1–7 *Cardiocondyla* workers. 1, profile of *shuckardi*. 2, head of *shuckardi*. 3–7, alitrunk and pedicel segments of (3) *monardi*, (4) *wroughtonii*, (5) *emeryi*, (6) *weserka*, (7) *neferka*.

the Pacific coast of North America. The fauna of the Afrotropical region includes 9 *Cardiocondyla* species. Of these six are found only in this region, two are the common tramps *emeryi* and *wroughtonii*, and one also occurs on Madagascar (*shuckardi*). One of the six endemic species, *zoserka*, described from a series of females, is suspected of being the first inquiline to be found in this genus.

The majority of species of the world are known only from workers; a few queens are known and these are quite normal apart from having the wing venation much reduced. The peculiarity of *Cardiocondyla* lies in the males, which are known to be dimorphic in several species. Ordinary alate males are known for a fair number of species but in some (*emeryi*, *wroughtonii*, *elegans*, *batesii* Forel) dealate, highly ergatoid males are also produced; such peculiar males were responsible for two of the generic names in the synonymy above, *Emeryia* and *Xenometra*. In a further species, *papuana* (Reiskind), the only known male is an ergatoid. The problem is that the extent of ergatoid male production among the species, and the reasons for the production of such males, is unknown. It may well be that all species of *Cardiocondyla* are capable of developing both normal and ergatoid males, given the right conditions, but it may be that some species only have normal alate males, some only have ergatoid males, and some have both. It is certainly an intriguing problem and deserves further investigation.

Recent studies of *Cardiocondyla* include the works of Wilson & Taylor (1967) on the Pacific species, and of Bernard (1956) on the Palaearctic fauna; the species of sub-Saharan Africa have not been dealt with previously.

To the present *Cardiocondyla* has occupied its own tribe, the Cardiocondylini, characterized primarily by its prominent clypeus and broad postpetiole in the worker, and the reduced venation in the female. Other features noted by Emery (1922*a*) and Wheeler (1922) have been eroded away by subsequent discoveries of species not then known. Nevertheless, the tribal status has remained as such since 1922 although Urbani (1977) has recently pointed out the similarity between *C. monardi* and *Leptothorax*. He interpreted this as convergence but I consider that a real relationship exists between *Leptothorax* and *Cardiocondyla* and that the latter belongs in tribe Leptothoracini. Comparing the two genera there is broad agreement in head shape, dentition, high palp formula, position of eyes, antennal segmentation, size and shape of frontal lobes, broad insertion of the posterior clypeus between the frontal lobes, lack of scrobes and frontal carinae, size and position of propodeal spiracle, and form of the metapleural lobes. The presence of all these characters together in both genera argues strongly that they are genuinely closely related and I propose the dissolution of Cardiocondylini and the incorporation of its sole genus in the Leptothoracini. Within the tribe *Cardiocondyla* is still separated from *Leptothorax* and its close relatives (as discussed under that genus) by the characters devised by Emery and Wheeler, namely the specialized form of the anterior clypeus (although this is hinted at in some *Leptothorax*), the characteristic form of the postpetiole and the reduced wing venation of the females. A further character distinguishing the two is the specialized blade-like sting of *Cardiocondyla*, not seen in *Leptothorax*.

Synonymic list of Afrotropical *Cardiocondyla* species

emeryi Forel
    emeryi var. *rasalamae* Forel **syn. n.**
    emeryi subsp. *mahdii* Karavaiev **syn. n.**
    monilicornis Emery
    nuda subsp. *nereis* Wheeler
    mauritia Donisthorpe **syn. n.**
monardi Santschi
neferka **sp. n.**
nilotica Weber
sekhemka **sp. n.**
shuckardi Forel
    globinodis Stitz **syn. n.**
    badonei Arnold **syn. n.**
    wassmanni [sic] Santschi **syn. n.**

wasmanni var. *sculptior* Santschi **syn. n.**
brevispinosa Weber **syn. n.**
fusca Weber **syn. n.**
weserka **sp. n.**
wroughtonii (Forel)
wroughtonii var. *hawaiensis* Forel
emeryi subsp. *chlorotica* Menozzi **syn. n.**
zoserka **sp. n.**

Key to species (workers)

Note. *C. zoserka*, described from suspected inquiline females, is omitted from the key.

1 With alitrunk in profile the dorsum without trace of a metanotal groove or impression (Fig. 3). Propodeum unarmed. Postpetiole in dorsal view distinctly longer than broad. (Angola) ***monardi*** (p. 314)

– With alitrunk in profile the dorsum with a distinct metanotal groove or impression (Figs 1, 4–7). Propodeum sharply angulate to bispinose. Postpetiole in dorsal view as broad as to markedly broader than long 2

2 With the head in full-face view the scapes, when laid back, distinctly exceeding the occipital corners. (Sudan) . . . . ***nilotica*** (p. 315)

– With the head in full-face view the scapes when laid back, either failing to reach or just reaching the occipital corners, never exceeding them 3

3 Dorsal surfaces of head and alitrunk smooth and glossy, unsculptured everywhere except for widely separated minute punctulae on the head. Head relatively broad and scapes short, CI 86, SI 74. (Ghana) . . . . ***sekhemka*** (p. 315)

– Dorsal surfaces of head, alitrunk or both finely and densely sculptured, the sculpture usually conspicuous. Scapes longer, SI > 80. Head with CI usually < 80, rarely otherwise . . . 4

4 Propodeum in absolute profile bluntly angulate to bidenticulate (Fig. 1), never with a pair of strong teeth or spines which are longer than their basal width in profile and which are as long as half the distance separating their bases in dorsal view. Scapes relatively long, SI in range 93–100. (Widespread in sub-Saharan Africa; Madagascar) . . . . . ***shuckardi*** (p. 316)

– Propodeum in absolute profile strongly bidentate to bispinose (Figs 4–7), the teeth or spines longer than their basal width in profile and at least as long as half the distance separating their bases in dorsal view. Scapes relatively short, SI in range 81–94 5

5 With alitrunk in profile the propodeal dorsum approximately flat behind the metanotal groove and more or less level with the promesonotal dorsum, the propodeal dorsum not showing a long gradual slope down to the spines (Fig. 6). (Cameroun) . . . . . . ***weserka*** (p. 317)

– With alitrunk in profile the propodeal dorsum convex behind the metanotal groove and then showing a long gradual slope down to the spines (Figs 4, 5, 7) 6

6 With alitrunk in profile the mesonotal dorsum abruptly changing slope posteriorly and descending steeply to the metanotal groove (Fig. 4). Petiole node in dorsal view subglobular, usually slightly broader than long. Head relatively broad, CI in range 79–86. (Pantropical tramp species) . . . . ***wroughtonii*** (p. 317)

– With alitrunk in profile the mesonotal dorsum curving evenly into the metanotal groove, without an abrupt change of slope posteriorly (Figs 5, 7). Petiole node in dorsal view not subglobular, usually quite distinctly longer than broad. CI in range 72–79 7

7 Pronotal corners bluntly but conspicuously angular in dorsal view. Propodeal spines relatively long and slender (Fig. 7). (Ghana, Cameroun). . . . . ***neferka*** (p. 314)

– Pronotal corners rounded in dorsal view. Propodeal spines relatively short and stout (Fig. 5). (Cosmopolitan tramp species, very common) . . . . ***emeryi*** (p. 312)

Cardiocondyla emeryi Forel

(Fig. 5)

Cardiocondyla emeryi Forel, 1881: 5. Syntype workers, VIRGIN IS.: St Thomas I., 1878 (MHN, Geneva) [examined].

Cardiocondyla emeryi var. *rasalamae* Forel, 1891: 161. Syntype workers, MADAGASCAR: Imerina (*P. Camboué*) (MHN, Geneva) [examined]. **Syn. n.**

Cardiocondyla emeryi subsp. *mahdii* Karavaiev, 1911: 8. Syntype workers, SUDAN: Khartoum, Sirdargarten, no. 1900 (*V. Karavaiev*) (ZM, Kiev) [examined]. **Syn. n.**

Xenometra monilicornis Emery, 1917: 96. Holotype ergatoid male [not female], VIRGIN IS.: St Thomas I. (MCSN, Genoa). [Synonymy by Urbani, 1973: 200.]

Cardiocondyla nuda subsp. *nereis* Wheeler, 1927: 140. Syntype workers, females, NORFOLK I.: 1915 (*A. M. Lea*) (MCZ, Cambridge). [Synonymy by Wilson & Taylor, 1967: 53.]

Cardiocondyla mauritia Donisthorpe, 1946: 776. Holotype and paratype workers, MAURITIUS: 1941–45, no. 102 (*R. Mamet*) (BMNH) [examined]. **Syn. n.**

WORKER. TL 1.7–2.1, HL 0.45–0.52, HW 0.34–0.38, CI 72–78, SL 0.30–0.36, SI 86–94, PW 0.22–0.28, AL 0.48–0.58 (40 measured).

Antennal scapes of moderate length (SI, above), when laid back on the head usually failing to reach the occipital corners but in a few samples just reaching them; never distinctly exceeding the occipital corners. Maximum diameter of eye 0.10–0.12, about 0.28–0.32 × HW and with 8–10 ommatidia in the longest row. Head always conspicuously longer than broad in full-face view, CI > 80 in all samples examined. With the alitrunk in dorsal view the pronotal corners narrowly but evenly rounded, not produced into angular shoulders. In profile the alitrunk with the promesonotal dorsum forming an even shallow convexity from front to back, the slope of the dorsum not changing radically just in front of the metanotal groove. Metanotal groove sharply and conspicuously impressed, the propodeal dorsum convex behind the groove, then entering a long slope down to the propodeal spines. In profile the propodeal spines short and stoutly constructed but longer than their basal width. In dorsal view each spine longer than half the distance separating their bases. Petiole and postpetiole shaped as in Fig. 5, the petiole node showing some variation in shape but in dorsal view always at least as long as broad and usually distinctly longer than broad. Peduncle of petiole moderately long, the sternite of the postpetiole showing a blunt anteroventral prominence or bulge. Postpetiole in dorsal view much broader than long, with a shallowly concave anterior margin and evenly convex sides. Dorsal surfaces of head and alitrunk usually with scattered fine punctures, the surface between them finely and densely shagreened or granular. In some specimens the punctures are very small or widely scattered and inconspicuous, in which case the entire surface appears shagreened to granular. Occasionally the granular ground-sculpture is reduced leaving the fine punctures on a more or less smooth surface. Sculpture on the dorsal head is frequently stronger and better defined than on the dorsal alitrunk. Hairs absent except on mouthparts and around gastral apex but a fine appressed pubescence is present all over the body, being more conspicuous on the darkly coloured gaster than elsewhere. Head and alitrunk yellow to light brown, sometimes orange-brown; gaster much darker, blackish brown to black and contrasting strongly with the head and alitrunk.

A well known highly successful tramp-species, *emeryi* has been spread widely over the earth's surface, mainly by human commerce. In the tropics and subtropics it survives outside, but in the temperate zones it is more or less restricted to constantly heated buildings and greenhouses. The presence of two very closely related species in West Africa, *neferka* and *weserka*, implies that the Afrotropical region is most probably the place of origin of *emeryi*.

Like a few other species *emeryi* is known to have dimorphic males (see discussion, p. 311). The species usually produces normal winged males but sometimes also develops highly ergatoid males which may be found wandering alone, far from any nest.

MATERIAL EXAMINED

Afrotropical region. **Ghana:** Polcoase (*W. Bellfield*); Kibi (*D. Leston*). **Nigeria:** Gambari (*B. Bolton*); Bussa (*J. T. Medler*). **Cameroun:** Nkoemvon (*D. Jackson*). **Angola:** Luanda (*G. R. Gradwell & D. Snow*). **Sudan:** Khartoum (*V. Karavaiev*). **Uganda:** Ruwenzori, Semliki Forest (*D. S. Fletcher*). **Kenya:** Embu, Ishiara (*V. Mahnert & J.-L. Perret*). **Tanzania:** Lindi (*D. V. Fitzgerald*); Manyara Nat. Park (*M. E. Irwin & E. S. Ross*); Zanzibar (*L. F. Brown*). **Zimbabwe:** Bembesi (*G. Arnold*). **Botswana:** Shorobe (*A. Russell-Smith*). **South Africa:** Durban (*C. B. Cooper*); Nelspruit (*M. Samways*).

Other regions. **Madagascar:** Joffreville (*J. M. Betsch*); Imerina (*P. Camboué*). **Seychelles:** Little Sister I. (*U. Müller*). **Aldabra:** South I. (*B. Cogan & A. M. Hutson*). **Chagos Archipelago:** Diego Garcia (*A. M. Hutson*). **Ascension I.** (*E. A. G. Duffey*). **Egypt:** Gizeh (*F. Morey*); Siwa (*J. Omer-Cooper*); Zegawa (*J. Omer-Cooper*). **Madeira:** Funchal (*N. L. H. Krauss*). **Cape Verde Is.:** Fogo (*Lindberg*); Fogo (*Groh*); S. Vincente (*Lindberg*); S. Tiago (*Lindberg*); Nicolau (*Lindberg*); St Helena (*Wollaston*). **Virgin Is.:** St Vincent I. (*H. H. Smith*); St Thomas I. **West Indies:** Anguilla (*A. G. Parker*). **Puerto Rico:** Mayaquez (*M. R. Smith*). **Norfolk I.** (*A. M. Lea*). **Mauritius** (*R. Mamet*).

For Pacific distribution see Wilson & Taylor (1967); for Neotropical distribution see Kempf (1972).

Cardiocondyla monardi Santschi

(Fig. 3)

Cardiocondyla (*Loncyda*) *monardi* Santschi, 1930: 70, fig. 5. Syntype workers, ANGOLA: Rio Mbalé, ix.1928–i.1929 (*A. Monard*) (NM, Basle) [examined].

WORKER. TL 2.7, HL 0.58, HW 0.46, CI 79, SL 0.49, SI 107, PW 0.33, AL 0.68.

Antennal scapes relatively long, SI > 100; when laid back on the head exceeding the occipital corners. Maximum diameter of eye 0.14, about 0.30 × HW and with approximately 14 ommatidia in the longest row. Pronotal corners in dorsal view broadly and evenly rounded. Alitrunk in profile with the dorsum forming a single uninterrupted surface, without trace of a metanotal groove or impression. Propodeum unarmed, the dorsum rounding broadly, smoothly and evenly into the declivity. Petiole in profile with a very long anterior peduncle and a long low feebly convex node. Petiole node in dorsal view subglobular, only very slightly longer than broad. Postpetiole in dorsal view somewhat longer than broad, narrow (*c*. 0.13) at its junction with the petiole, then rapidly broadening posteriorly to a maximum width of *c*. 0.26 at about its midlength, and behind this narrowing again to a posteriormost width of *c*. 0.20. Dorsal length of postpetiole about 0.30, of petiole peduncle plus node about 0.40. All dorsal surfaces of head, alitrunk, petiole, postpetiole and first gastral tergite reticulate-punctate. Whole of body dorsally with glinting silvery pubescence which is mostly set within the punctures. Colour yellow with glinting silvery highlights due to the pubescence.

This very distinctive species should not be confused with any other African form. It is quickly separated from all its congeners in the Afrotropical region by its long scapes, lack of a metanotal groove or impression, absolutely unarmed propodeum, elongate pedicel segments and glinting silvery pubescence on a yellow background.

MATERIAL EXAMINED

Angola: Rio Mbalé (*A. Monard*).

Cardiocondyla neferka sp. n.

(Fig. 7)

HOLOTYPE WORKER. TL 1.8, HL 0.48, HW 0.36, CI 75, SL 0.32, SI 89, PW 0.26, AL 0.49.

Antennal scapes of moderate length (SI 87–91 in type-series), when laid back on the head not reaching the occipital corners in full-face view. Maximum diameter of eye 0.11, about 0.31 × HW and with 9–10 ommatidia in the longest row. Head conspicuously longer than broad, CI < 80. Pronotum in dorsal view with narrowly rounded, somewhat prominent corners, giving the ant a conspicuously square-shouldered appearance. With the alitrunk in profile the promesonotum forming an even shallow convexity from front to back which grades into the metanotal groove without passing through an abrupt change of slope. Metanotal groove shallowly impressed, the propodeal dorsum shallowly convex behind the groove, then sloping downwards posteriorly towards the spines. Propodeal spines elongate and narrow, in profile much longer than their basal width; in dorsal view the spines slightly incurved and each as long as the distance separating their bases. Shape of pedicel segments as in Fig. 7. In dorsal view the petiole node longer than broad, the postpetiole distinctly broader than long and broadest at its midlength. Dorsum of head shagreened-granular, the sculpture very fine and dense, blanketing the surface. Promesonotal dorsum very finely and densely superficially shagreened and mat, but the propodeal dorsum with only vestigial sculpture and glossy, much less densely sculptured than the promesonotum. Dorsal surfaces of petiole, postpetiole and gaster unsculptured except for a faint and patchy superficial patterning. Hairs absent except on mouthparts but a fine appressed pubescence is present which is most apparent on the gaster. Colour uniform light brownish yellow, the dorsum of the head slightly darker than the sides; sides of the first gastral tergite a rich darker brown.

PARATYPE WORKERS. TL 1.80–1.81, HL 0.46–0.48, HW 0.35–0.37, CI 76–79, SL 0.32–0.33, SI 87–91, PW 0.24–0.27, AL 0.48–0.51 (3 measured).

Maximum diameter of eye 0.10–0.11, about 0.27–0.31 × HW and with 9–10 ommatidia in the longest row. As holotype but in a couple the darker colour of the sides of the first gastral tergite extends onto the dorsum.

Holotype worker, **Ghana:** Mampong, 10.ii.1970 (*P. Room*) (BMNH).

Paratypes. 3 workers with same data as holotype (BMNH; NM, Basle; MCZ, Cambridge).

Non-paratypic material examined. **Cameroun:** Nkoemvon (*D. Jackson*).

The Cameroun material differs from the type-series only in colour as here the dorsum of the head is conspicuously much darker than the sides and the gaster is uniformly dark brown. This is merely an intensification of the condition seen in the type-series and has no significance at species-level.

C. neferka is closest related to *emeryi* but is quickly separable by its elongate narrow propodeal spines and conspicuously square-shouldered appearance when the pronotum is seen in dorsal view.

Cardiocondyla nilotica Weber

Cardiocondyla nilotica Weber, 1952: 8, fig. 13. Holotype worker, SUDAN: White Nile R., Ed Dueim, lat. 14° 00′ N., 2.vii.1939, no. 1234 (*N. A. Weber*) (not in AMNH, New York; presumed lost).

The only known representative of this species cannot be found in AMNH, New York and must be presumed lost. However, Weber's original description contains enough information to give a reasonable picture of this species, and it appears distinct from all other species of the Afrotropical region. The following diagnostic characters are taken from Weber's description.

WORKER. TL 2.5. Antennal scapes when laid back distinctly exceeding the occipital corners. Metanotal groove broad and rounded-concave. Propodeum armed with a pair of short triangular tubercles. Peduncle of petiole slender. Petiole node in dorsal view broader than long, the postpetiole slightly broader than long (taken from Weber's fig. 13, where the postpetiole appears subglobular in dorsal view). Densely and finely punctate on head and alitrunk, gaster smooth and shining. Colour bright ferruginous, the head with a dark area dorsally; appendages pale and gaster dark brown.

The overall picture which emerges is of a relatively large species closely related to *shuckardi* but with decidedly longer scapes, narrower postpetiole and lighter colour, although a few pale coloured individuals of *shuckardi* are known.

Cardiocondyla sekhemka sp. n.

HOLOTYPE WORKER. TL 1.8, HL 0.44, HW 0.38, CI 86, SL 0.28, SI 74, PW 0.12, AL 0.32.

Head relatively short and broad, scapes relatively short (CI and SI, above). When laid back on the head the scapes failing to reach the occipital corners in full-face view. Projecting median portion of clypeus and flattened prominent lateral parts of clypeus closely fused and forming a more or less evenly semicircular projecting lobe which hides most of the mandibles in full-face view (only the two apicalmost teeth of the right mandible can be seen in the holotype). Eyes relatively large, maximum diameter 0.12, about 0.32 × HW and with 10–11 ommatidia in the longest row. Shape of eye irregular in profile, narrowed and drawn out anteroventrally, rounding the lower curve of the sides and onto the margins of the ventral surface of the head. Pronotal corners rounded in dorsal view. With alitrunk in profile the promesonotum evenly convex from front to back, sloping posteriorly to the feebly impressed metanotal groove. Propodeal dorsum more shallowly convex than promesonotum and on a much lower level so that there is a distinct step-down from the promesonotum to the propodeum. Posteriorly the propodeal dorsum sloping down to a pair of broad blunt and very low tubercles which are much shorter than the metapleural lobes and which are shorter than their basal widths. In dorsal view the tubercles distinctly shorter than half the distance separating their bases. Petiole in profile with a short peduncle and rounded node. In dorsal view the petiole node subglobular, slightly broader than long. Postpetiole in dorsal view much broader than long, with a shallowly concave anterior margin and evenly convex sides. Dorsum of head sculptured with widely scattered superficial minute punctulae, the surface between the punctulae smooth and shining. Remainder of body unsculptured, smooth and shining. Hairs absent except on mouthparts and gastral apex. Colour uniform glossy blackish brown, the legs and antennae lighter.

Holotype worker, **Ghana**: Tumu, 24.xii.1969 (*P. Room*) (BMNH).

This small, virtually unsculptured darkly coloured species is easily recognised by its relatively short scapes, broad head, characteristically shaped eyes, lack of developed propodeal spines and feebly impressed metanotal groove followed by a depressed propodeum. In the Afrotropical region only *wroughtonii* approaches the CI value of *sekhemka*, but in that species the propodeal spines are long and strongly developed. Only *shuckardi* has the propodeal armament as feebly developed as in *sekhemka* but here the head and body are usually strongly sculptured, the eye is not drawn out anteroventrally, and the dimensions are very different.

Cardiocondyla shuckardi Forel

(Figs 1, 2)

Cardiocondyla shuckardi Forel, 1891: 161. Syntype workers, MADAGASCAR: Imerina, Antananarivo (*Camboué*) (MHN, Geneva) [examined].

Cardiocondyla globinodis Stitz, 1923: 154. Syntype workers, SOUTH WEST AFRICA: Omaruru, 22.vi.1911 (*W. Michaelsen*) (MNHU, Berlin) [examined]. **Syn. n.**

Cardiocondyla badonei Arnold, 1926: 225, fig. 64. Syntype workers, MOZAMBIQUE: Amatongas Forest, ii.1917 (*G. Arnold*) (BMNH; MCZ, Cambridge) [examined]. **Syn. n.**

Cardiocondyla wassmanni [sic] Santschi, 1926: 241. Holotype worker, CAMEROUN: Gr. Batanga (*R. P. E. Wasmann*) (NM, Basle) [examined]. **Syn. n.**

Cardiocondyla wasmanni var. *sculptior* Santschi, 1926: 241. Holotype worker, GABON: Samkita (*F. Faure*) (NM, Basle) [missing from mount]. **Syn. n.**

Cardiocondyla brevispinosa Weber, 1952: 6. Holotype worker, ZAIRE: Beni, lat. 0° 24′ N., long. 29° 24′ E., 24.ii.1948, no. 2116 (*N. A. Weber*) (not in AMNH, New York; presumed lost). [Junior secondary homonym of *Pheidole brevispinosa* Donisthorpe 1947: 593 (= *Cardiocondyla paradoxa* Emery); synonymy by M. R. Smith, 1955: 305.] **Syn. n.**

Cardiocondyla fusca Weber, 1952: 7. Holotype worker, UGANDA: Jinja, 15.viii.1939, no. 1495 (*N. A. Weber*) (not in AMNH, New York; presumed lost). **Syn. n.**

WORKER. TL 2.0–2.6, HL 0.50–0.60, HW 0.38–0.46, CI 75–79, SL 0.36–0.45, SI 93–100, PW 0.27–0.35, AL 0.54–0.69 (35 measured).

Antennal scapes when laid back on the head in full-face view either just failing to reach or just reaching the occipital corners, never distinctly surpassing them; the scapes moderately long, SI > 90. Maximum diameter of eye 0.11–0.14, about 0.26–0.30 × HW and with 9–12 ommatidia in the longest row. Head always obviously longer than broad, CI < 80 in material examined. Pronotal corners in dorsal view broadly and evenly rounded. With the alitrunk in profile the promesonotal dorsum forming an even shallow convexity from front to back, sloping evenly into the metanotal groove. Metanotal groove impressed but the depth of the impression varying between samples. To some extent the apparent variation in depth is caused by the convexity of the propodeum behind the groove as in some cases it rises more steeply and is more convex than in others. Propodeal dorsum behind the convex portion sloping downwards posteriorly to the junction with the declivity. Propodeal armament very reduced, at best represented only by a pair of minute triangular denticles which may be acute or blunted, or by a pair of tubercles, or merely bluntly angular; never with developed teeth or spines (Fig. 1). In dorsal view the propodeal armament scarcely visible, the length of each component constituting only a fraction of the distance separating their bases. Petiole node in dorsal view subglobular, usually broader than long but in some only about as broad as long. Postpetiole distinctly broader than long. In profile the petiole and postpetiole as in Fig. 1, the petiolar dorsum convex and somewhat variable in length. Sculpture of dorsal head and alitrunk usually of fine, very dense blanketing shagreening or granulation, but this may be reduced on the alitrunk or even on the head, though less frequently on the latter than on the former. In extreme cases the dorsal alitrunk may be almost smooth. Hairs absent except on mouthparts and gastral apex. Colour varying from medium brown to blackish brown, sometimes black.

The commonest and most widespread endemic species in the Afrotropical region, *shuckardi* is recognised by its dimensions and extremely reduced propodeal armament. Other species in the region with reduced propodeal armament include *monardi*, *sekhemka* and *nilotica*. In the first of these the metanotal groove is absent and the pedicel segments are very elongate (Figs 1, 3). *C. sekhemka* is a much smaller species with shorter scapes and a broader head, and *nilotica* has longer scapes than *shuckardi* and a narrower postpetiole.

MATERIAL EXAMINED

Ghana: Kibi (*D. Leston*); Mampong (*P. Room*); Mole G. R. (*J. C. Greig*). **Nigeria:** Ibadan (*K. Whitney*); Ibadan (*B. Critchley*). **Cameroun:** Nkoemvon (*D. Jackson*); Batanga (*Wasmann*). **Zimbabwe:** Umtali (*G. Arnold*). **Botswana:** Shorobe (*A. Russell-Smith*). **South West Africa:** Okahanja (*P. Hammond*); Omaruru (*W. Michaelsen*). **South Africa:** Transvaal, Plaston (*M. Samways*); Nelspruit (*M. Samways*); Natal, Ubombo (*W. L. & D. E. Brown*); Illovo (*P. Atkinson*). **Mozambique:** Amatongas Forest (*G. Arnold*). **Madagascar:** Mont d'Ambre (*J. M. Betsch*); Antananarivo (*Camboué*).

Cardiocondyla weserka sp. n.

(Fig. 6)

Holotype worker. TL 1.9, HL 0.46, HW 0.35, CI 76, SL 0.32, SI 91, PW 0.25, AL 0.48.

Antennal scapes moderately long but when laid back on the head failing to reach the occipital corners in full-face view. Maximum diameter of eye 0.12, about 0.34 × HW and with 9–10 ommatidia in the longest row. Pronotum in dorsal view with the corners narrowly rounded but not prominent. With the alitrunk in profile the promesonotum with its dorsum almost flat, rounding broadly into its anterior declivity but running into the metanotal groove almost in a straight line, with only the feeblest of curves. Metanotal groove narrowly but quite distinctly impressed. Behind the metanotal groove the propodeal dorsum more or less flat and on a slightly higher level than the posterior part of the promesonotum; the propodeal convexity behind the metanotal groove followed by a long slope down to the spines, which is characteristic of most species of the region, is absent here. Propodeal spines elongate and narrow, much longer than their basal width in profile; in dorsal view the spines somewhat incurved, each spine easily as long as the distance separating their bases. Shape of pedicel segments in profile as in Fig. 6. In dorsal view the petiole node conspicuously longer than broad, its dorsal surface narrow. Postpetiole much broader than long, its anterior face slightly concave, its sides convex. Dorsum of head blanketed by a fine dense granular sculpture or shagreening. Dorsal promesonotum more lightly shagreened than head, the sculpture here being extremely fine and very dense indeed. Propodeal dorsum with same sculpture as promesonotum but somewhat weaker and appearing shiny in places. Petiole and postpetiole very finely and superficially shagreened. Hairs absent except on mouthparts but a fine appressed pubescence is present, most easily visible on the first gastral tergite. Alitrunk medium brown, the appendages slightly lighter. Head dorsally and gaster blackish brown to black. Pedicel segments intermediate in shade between alitrunk and gaster.

Holotype worker, **Cameroun:** Nkoemvon, 1980, no. M35 (*D. Jackson*) (BMNH).

Among the species of the region in which the metanotal groove is impressed, *weserka* is immediately distinguished by the shape of the propodeal dorsum. In general the propodeal dorsum is convex behind the groove and then enters a long slope down to the tubercles, spines or teeth (Figs 1, 4, 5, 7), but in *weserka* the dorsum is almost flat and does not conform to this usual shape (Fig. 6).

Cardiocondyla wroughtonii (Forel)

(Fig. 4)

Emeryia wroughtonii Forel, 1890: cxi. Holotype male [ergatoid, not worker], India: Poona (*Wroughton*) (MHN, Geneva) [examined].

Cardiocondyla wroughtonii (Forel) Forel, 1892: 313.

Cardiocondyla wroughtonii var. *hawaiensis* Forel, 1899: 119. Syntype workers, Hawaii: Molokai (MHN, Geneva). [Synonymy by Wilson & Taylor, 1967: 56.]

Cardiocondyla emeryi subsp. *chlorotica* Menozzi, 1930: 84. Syntype workers, female, Somali Republic: Duca Abruzzi, x.1926 (*G. Paoli & A. Chiaromonte*) (IE, Bologna) [examined]. **Syn. n.**

Worker. TL 1.6–1.9, HL 0.42–0.50, HW 0.34–0.40, CI 79–86, SL 0.30–0.36, SI 81–89, PW 0.24–0.28, AL 0.46–0.55 (25 measured).

Small species with relatively broad head and short scapes, CI and SI above. When laid back on the head the scapes failing to reach the occipital corners in full-face view. Maximum diameter of eye 0.09–0.11, about 0.26–0.30 × HW and with 9–11 ommatidia in the longest row. Pronotal corners rounded in dorsal view. With the alitrunk in profile the promesonotum forming a shallow convexity from front to back but the slope changing sharply posteriorly and becoming quite steep where it slopes down to the strongly impressed metanotal groove; this change in slope very conspicuous in absolute profile. Propodeal dorsum behind the metanotal groove convex in profile, then entering a long downward slope to the propodeal spines. Propodeal spines enlongate and narrow in profile, longer than their basal width; in dorsal view each spine as long as the distance separating their bases. Petiole node in dorsal view subglobular, as broad as or slightly broader than long. Postpetiole distinctly broader than long. Dorsal surfaces of head and alitrunk blanketed by fine shagreening or punctulate shagreening. Petiole and postpetiole finely superficially shagreened. Hairs absent except on mouthparts and gastral apex but a sparse appressed pubescence is present, easiest seen on the first gastral tergite. Head, alitrunk and appendages yellow to yellowish brown, colour of gaster variable. Frequently the gaster is the same colour as the head and alitrunk but in some the sides of the tergite are darker than the dorsum. In others the darker colour has also extended across the posterior portion of the first tergite and in some the gaster is uniformly dark.

A tramp species probably originating in South East Asia, *wroughtonii* is now widespread in the tropics and subtropics. Amongst the Afrotropical region species *wroughtonii* is recognizable by its small size, relatively short scapes and broad head, subglobular petiole node in dorsal view, and the characteristic shape of the promesonotum in profile. In terms of CI it is approached only by *sekhemka*, but this species is uniformly dark in colour, has much shorter scapes (SI 74), and has a differently shaped alitrunk.

MATERIAL EXAMINED

Afrotropical Region. **Somali Republic:** Duca Abruzzi (*Paoli & Chiaromonte*). **Tanzania:** Dar es Salaam (*A. J. Halstead*); Zanzibar (*M. J. Way*).

Other regions. **West Malaysia:** Alor Star (*G. H. Lowe*); Gombak (*B. Bolton*). **Australia:** Qld, Mackay (*R. E. Turner*). **Japan:** Chichi-jima, Ogasahara (*M. Tanaka*). **Hawaii:** Molokai (*R. C. L. Perkins*). **Sri Lanka:** Peradeniya (*A. Rutherford*); Nawalapitiya. **India:** Poona (*Wroughton*); Pusa (*S. D. Agarwala*). **Thailand. U.S.A.:** Fla, Dade Co., Tamiami Trail (*W. F. Buren*).

Cardiocondyla zoserka sp. n.

HOLOTYPE FEMALE. TL 3.3, HL 0.68, HW 0.55, CI 81, SL 0.46, SI 84, PW 0.47, AL 1.04.

With the head in full-face view the outer margins of the mandibles conspicuously sinuate, passing through a right-angle apically and forming a flat transverse anterior margin along to the apical tooth. Masticatory margin of mandible with the usual five teeth but the apical tooth considerably enlarged, the three basalmost teeth very small. Form of clypeus more *Leptothorax*-like than is usual in the genus, with a broadly and evenly convex anterior lobe which projects over the base of the mandibles and with an impressed area between the frontal lobes behind the posterior margin of the clypeus. Funicular segments of antennae with bizarre modification and highly characteristic. In dorsal view funicular segment 1 slightly longer than broad, 2 slightly broader than long, but thereafter segments 3–10 short and very broad, becoming even broader apically and with segments 8–10 extremely broad. The apical funicular segment swollen-conical in dorsal view. In ventral view the funiculus even more bizarre. Segments 1–5 appearing the same as in dorsal view, segments 6–7 flattened dorsoventrally, segment 8 slightly transversely concave, the very broad segment 9 strongly transversely concave and segment 10 so concave that the strongly arched ventral surface appears almost to touch the dorsal at the point of maximum concavity. Apical segment invaginated and forming a cup-shaped hollow which extends deep into the segment. Ocelli distinct. Maximum diameter of eye 0.24, about 0.44 × HW. With alitrunk in dorsal view the mesoscutum slightly broader than long, the rounded pronotal corners visible anteriorly. In profile the propodeal dorsum sloping down posteriorly to a pair of small acute denticles. Petiole and postpetiole nodes both distinctly broader than long in dorsal view. Dorsal surfaces of head, mesoscutum and scutellum granular to shagreened, with scattered punctures, the mesoscutum also with very faint striate vestiges longitudinally. Dorsal propodeum with ground-sculpture vestigial to absent, with a few feeble transverse rugulae. Petiole, postpetiole and gaster with scattered minute punctulae dorsally. Hairs absent except on mouthparts but the body with a fairly dense and quite conspicuous appressed pubescence which is most easily visible on the first gastral tergite. Colour dark brown to blackish brown, the appendages lighter.

PARATYPE FEMALES. TL 2.9–3.3, HL 0.62–0.67, HW 0.51–0.55, CI 82–84, SL 0.42–0.46, SI 82–85, PW 0.42–0.46, AL 0.90–1.00 (4 measured).

As holotype but may be slightly lighter in colour. Sculpture reduced in some, the propodeal dorsum almost smooth and the dorsal alitrunk less intensely sculptured. Maximum diameter of eye 0.21–0.24, about 0.41–0.44 × HW.

Holotype female, **Nigeria:** nr Abuja, Gurara Falls, 20.iii.1972 (*E. Classey*) (BMNH).

Paratypes. 4 females with same data as holotype (BMNH; NM, Basle; MCZ, Cambridge).

Although it is not usual practice to describe ant species from isolated females I make an exception in this case for two reasons. Firstly, the modification of the mandibles, clypeal structure and antennal funiculi lead me to suspect that this species is an inquiline. Secondly, the bizarre modification of the funiculi renders the species immediately recognizable. To the best of my knowledge no other ant has funiculi even remotely resembling this one, and certainly they cannot be confused with any other member of *Cardiocondyla*. Assuming that I am correct in my supposition that *zoserka* is an inquiline species (which makes it the first one known in the genus), it is interesting to speculate what its host might be. Apart from the modifications of the head and its appendages the overall appearance of *zoserka* is very like that of *shuckardi* females. The two are definitely closely related and it may be that *shuckardi* represents the host of *zoserka.*

LEPTOTHORAX Mayr

(Figs 8–22)

Leptothorax Mayr, 1855: 431. Type-species: *Formica acervorum* F., 1793: 358, by subsequent designation of Bingham, 1903: 214.

Temnothorax Mayr, 1861: 68. Type-species: *Myrmica* (*Leptothorax*) *recedens* Nylander, 1856: 94, by monotypy. [Synonymy by Forel, 1890*a*: lxxii.]

Dichothorax Emery, 1895*b*: 323 [as subgenus of *Leptothorax*]. Type-species: *Leptothorax* (*Dichothorax*) *pergandei* Emery, 1895*b*: 323, by subsequent designation of Wheeler, 1911: 161. [Synonymy by Brown, 1973: 180.]

Goniothorax Emery, 1896: 58 [as subgenus of *Leptothorax*]. Type-species: *Leptothorax vicinus* Mayr, 1887: 620, by subsequent designation of Wheeler, 1911: 164. [Junior homonym of *Goniothorax* Milne-Edwards, 1879: 103 (Crustacea).]

Mychothorax Ruzsky, 1904: 288 [as subgenus of *Leptothorax*]. Type-species: *Formica acervorum* F., 1793: 358, by original designation. [Synonymy by M. R. Smith, 1950: 29.]

Nesomyrmex Wheeler, 1910: 259. Type-species: *Nesomyrmex clavipilis* Wheeler, 1910: 259, by monotypy. [As subgenus of *Leptothorax* and first available replacement name for *Goniothorax* Emery; M. R. Smith, 1950: 30.] **Syn. n.**

Tetramyrma Forel, 1912: 766 [as subgenus of *Dilobocondyla* Santschi]. Type-species: *Dilobocondyla* (*Tetramyrma*) *braunsi* Forel, 1912: 767, by monotypy. [Raised to genus; Forel, 1913*b*: 122. See also Bolton, 1976: 291.] **Syn. n.**

Caulomyrma Forel, 1914: 233 [as subgenus of *Leptothorax*]. Type-species: *Leptothorax echinatinodis* Forel, 1886*a*: xlviii, by original designation. [Synonymized with *Nesomyrmex* by Forel, 1915: 364.]

Myrmammophilus Menozzi, 1924: 29 [as subgenus of *Leptothorax*]. Type-species: *Leptothorax* (*Myrmammophilus*) *finzii* Menozzi, 1924: 29, by monotypy. [Synonymy by Brown, 1973: 182.]

Limnomyrmex Arnold, 1948: 222. Type-species: *Limnomyrmex stramineus* Arnold, 1948: 223, by original designation. [Synonymized with *Nesomyrmex* by Brown, 1971: 4.]

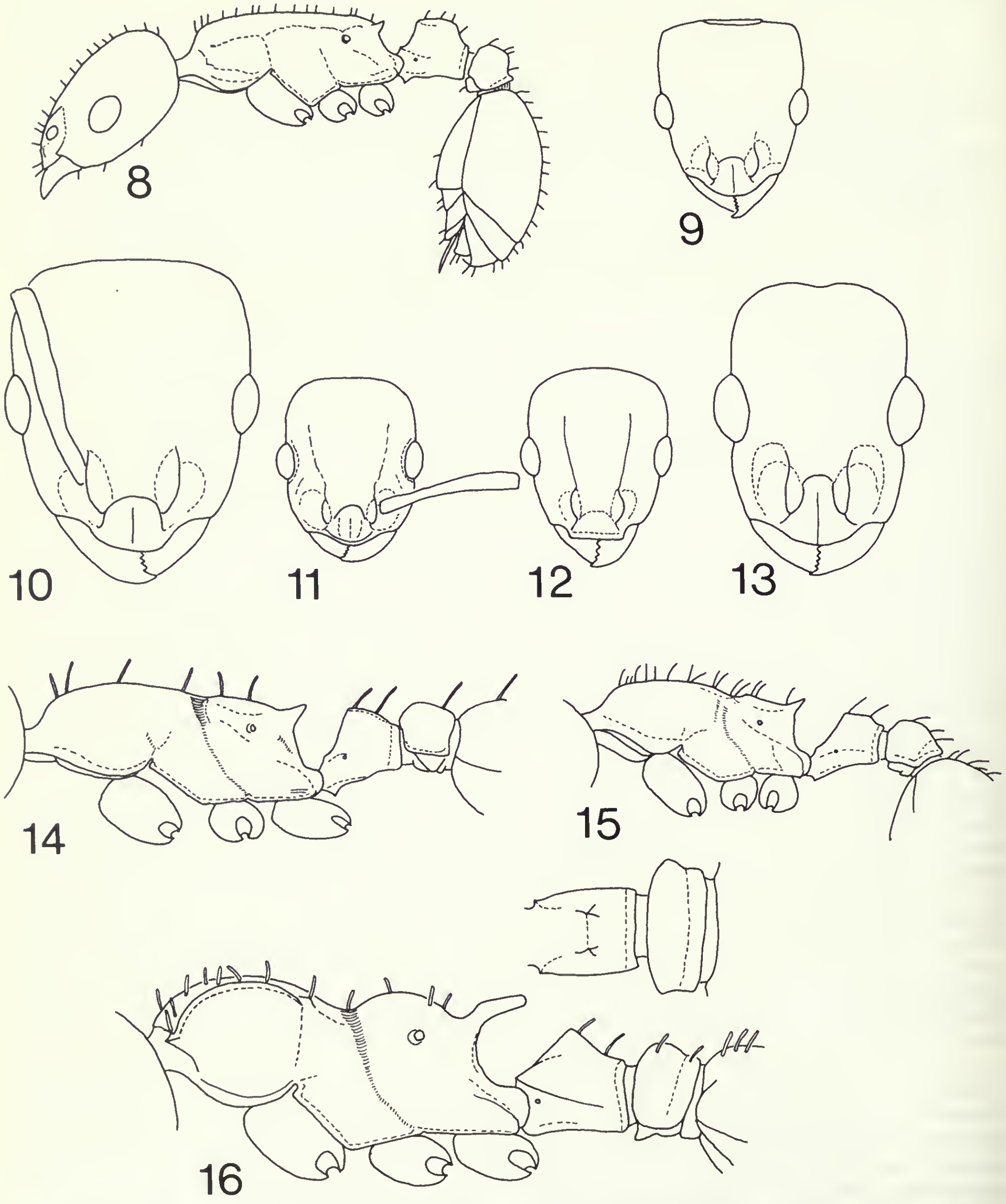
Myrafant M. R. Smith, 1950: 29 [as subgenus of *Leptothorax*]. Type-species: *Leptothorax curvispinosus* Mayr, 1866: 508, by original designation. [Synonymy by Brown, 1973: 182.]

Icothorax Hamann & Klemm, 1967: 415 [as subgenus of *Leptothorax*]. Type-species: *Leptothorax* (*Icothorax*) *megalops* Hamann & Klemm, 1967: 417, by monotypy. [Synonymized with *Myrafant* by Urbani, 1978: 556.]

DIAGNOSIS OF WORKER. Monomorphic myrmicine ants. Mandibles usually with five teeth (very rarely with 6) which decrease in size from apex to base. Palp formula 5, 3 (60 species examined by dissection or *in situ* count). Median portion of clypeus unmodified, broad and broadly inserted between the frontal lobes. Anterior margin of median portion of clypeus evenly arched-convex to strongly lobate, the lobe often prominent and concealing the basal border of the mandible or the basal tooth. Lateral portions of clypeus unmodified, not forming a raised narrow ridge or shield-wall in front of the antennal insertions. Frontal carinae usually absent but very rarely represented by a pair of faint narrow lines which run back from the ends of the narrow frontal lobes. Antennal scrobes absent. Antennae with 11–12 segments, with a conspicuous 3-segmented apical club. Eyes present, moderate to large in size and situated at or slightly in front of the midlength of the sides. Propodeal spiracle circular and frequently very small, situated usually at about the midlength of the segment and generally quite high up on the sides; never shifted back and down to a position close to the bases of the propodeal spines. Pronotal corners dentate to evenly rounded. Metapleural lobes rounded, usually small. Metanotal groove varying from absent to deeply impressed. Propodeum commonly bidentate or bispinose, only very rarely unarmed. Petiole nodiform, variable in shape, the anterior peduncle very variable in length and often with a denticulate process on each side dorsally where peduncle meets node. Sting strong and acute, without apical or apicodorsal lamelliform appendages, roughly cylindrical in section, not knife blade-like. Pilosity usually of short stout blunt hairs but sometimes hairs absent and sometimes elongate.

Leptothorax is a large genus with a worldwide distribution although the majority of species are Holarctic. Over 200 species have been described to date of which just 11 occur in sub-Saharan

Africa. The reason for this paucity of species in the Afrotropical region may well be the result of direct competition from the extremely varied and enormously successful tetramoriine fauna of the region (Bolton, 1976; 1980). In the past some members of *Leptothorax* and *Tetramorium* have been confused because of an overall convergent similarity of appearance between a few members of each genus. The following table will separate the workers of the two genera.



Figs 8–16 *Leptothorax* workers. 8, profile of *angulatus*. 9–13, heads of (9) *angulatus*, (10) *braunsi*, (11) *cenatus*, (12) *humerosus*, (13) *megalops*. 14–16, alitrunk and pedicel segments of (14) *megalops*, (15) *cenatus*, (16) *humerosus*. Pilosity omitted in 9–13.

Leptothorax	*Tetramorium*
Sting simple, without an apical or apicodorsal lamelliform appendage.	Sting with an apical or apicodorsal lamelliform appendage.
Maxillary palp with 5 segments.	Maxillary palp with 4 (or rarely 3) segments.
Lateral portions of clypeus not raised into a narrow ridge or shield-wall in front of the antennal insertions.	Lateral portions of clypeus raised into a narrow ridge or shield-wall in front of the antennal insertions.
Mandibles with 5 (rarely 6) teeth, decreasing in size from apex to base.	Mandibles usually with 7 teeth arranged as three enlarged teeth followed by 4 denticles. [One or two species with only 6 teeth but several with > 7 by increase of the denticle series.]
Propodeal spiracle set high on side of segment and about at its midlength; the spiracle usually in the anterodorsal quadrant of the side of the propodeum.	Propodeal spiracle shifted back and down, set behind the midlength; the spiracle usually in the posteroventral quadrant of the side of the propodeum.

Apart from the few African species revised below the taxonomy of most of the Old World fauna of *Leptothorax* is in a poor condition. Only the faunas of North America (Creighton, 1950; Brown, 1955) and of the Neotropical region (Kempf, 1959; Urbani, 1978) have been studied in any detail. The west European fauna is mostly covered by Bernard (1968), Collingwood (1978; 1979) and Kutter (1977) but the remainder of the Old World remains unstudied by modern methods.

Most of the generic synonymy noted above is straightforward and needs no further comment here; a few, however, require further explanatory notes, as follows.

Temnothorax, synonymized long ago by Forel (1890*a*) on the grounds that it graded into *Leptothorax*, has frequently been resurrected by European authors and treated either as a subgenus of *Leptothorax* or even as a separate genus (most recently by Bernard, 1968). The reason for this is not hard to find for among the west European species *recedens*, the type-species of *Temnothorax*, stands out as an oddity as it does not belong to any of the usual west European species-groups. However, when the extensive North African fauna is considered *recedens* is seen as a fairly unexceptional *Leptothorax* species, and when the world fauna is taken into consideration it seems decidedly mundane. The truth of the matter appears to be that *recedens*, along with a few other species, really belongs to the North African fauna but has managed to establish itself north of the Mediterranean. Urbani (1971) has discussed the validity of *Temnothorax* and concluded that Forel's approach was the only logical one. I agree completely and thus the original synonymy of Forel stands.

Tetramyrma, originally described as a subgenus of *Dilobocondyla* and later transferred into the Tetramoriini, was recognized by Bolton (1976) to be only dubiously separable from *Leptothorax*. On closer study it has not proved possible to find any genus-level characters to keep the name separate. The type-species of *Tetramyrma*, *braunsi*, seems odd at first sight because of its domed petiole and rounded, unarmed propodeum, but these developments are foreshadowed in *maximus* Santschi and its allies. *L. simoni*, the only other species ever placed in *Tetramyrma*, provides a good link back into the main mass of *Leptothorax* species, showing as it does a pair of propodeal teeth whilst otherwise resembling *braunsi* very closely.

Nesomyrmex, with its own set of earlier synonyms (*Caulomyrma*, *Goniothorax*, *Limnomyrmex*), is here formally synonymized with *Leptothorax* for the first time. Brown (1973) placed it as a possible synonym in his world list of genera. Some members of this predominantly tropical group appear very odd as a number of them have the petiole node denticulate, others have dentate pronotal corners and many have very prominent clypeal lobes. However, there do not appear to be any characters, either alone or in combination, which can serve to keep the former *Nesomyrmex* species separate from the mass of *Leptothorax*. The largest representation of this group occurs in South America and has been revised by Kempf (1959). His definition does not separate *Nesomyrmex* from *Leptothorax* and one of his stated characters, the 5,3 palp formula, seems universal in the genus. Species formerly placed in *Nesomyrmex* show considerable variation in form and grade into more ordinary *Leptothorax* in all their specialized characters.

In my opinion all the earlier synonymy quoted above is valid and none of the included names is deserving of further recognition as none of the characters invoked to separate them is consistent or particularly functional. In fact, the similarities so enormously outweigh the supposed differences, and the assumed diagnostic characters are so variable both within and between the supposed subgenera, that the subgeneric system used in *Leptothorax* was at best artificial, at worst misleading.

The only remaining subgeneric name in *Leptothorax* is *Macromischa* Roger (= *Antillaemyrmex* Mann, = *Croesomyrmex* Mann). Until recently this was treated as a good genus but Urbani (1978), in his revision of the group, showed that the more exotic species (formerly in *Macromischa*) graded into the more ordinary *Leptothorax* groups without it being possible to draw any meaningful dividing line. However, instead of sinking *Macromischa* he chose to treat it as a subgenus, though with considerable apprehension as some of the characters used are also demonstrable, as Urbani says, elsewhere in *Leptothorax*, whilst others are not consistent through *Macromischa* itself. The implication is that *Macromischa* is best regarded as a synonym of *Leptothorax*.

The closest relatives of *Leptothorax* include many small inquiline or dulotic genera, all of which are derived directly from *Leptothorax*. These genera are *Chalepoxenus* Menozzi, *Harpagoxenus* Forel, *Epimyrma* Emery, *Leonomyrma* Arnoldi, *Myrmoxenus* Ruzsky, *Doronomyrmex* Kutter, *Formicoxenus* Mayr, *Myrmetaerus* Soudek, and *Symmyrmica* Wheeler. Of these *Epimyrma* is characterized by a reduced palp formula of 4,2 or 3,2 and usually a reduced dentition; the genus may be valid. *Harpagoxenus* and *Chalepoxenus* both have strong frontal carinae and short scrobes. The two are basically very similar and retain the standard leptothoracine palp formula count of 5,3. The difference of antennae 11-segmented versus 12-segmented which is used to separate them is not convincing as both antennomere counts occur in *Leptothorax* (and several other myrmicine genera). The relationship of these two needs further study for, although *Chalepoxenus* was revised quite recently (Kutter, 1973) its standing with relation to *Harpagoxenus* was not discussed. The older separation based on mandibular dentition, with *Chalepoxenus* having dentate and *Harpagoxenus* edentate mandibles works for Europe, but the North American *Harpagoxenus* species have teeth.

Doronomyrmex, with its two parasitic species *pacis* Kutter and *pocahontas* Buschinger, seems indefensible as a genus. Its specialized features all result from inquiline syndrome characters common to numerous parasitic but otherwise unrelated ants. The same appears to be true of *Myrmetaerus* and *Myrmoxenus*, although further study of all these is needed. More information is also required of *Leonomyrma* and *Symmyrmica* as both genera have short but fairly prominent frontal carinae. The former also has the eyes shifted back on the head and the latter has 6-dentate mandibles although this is not unknown in *Leptothorax*.

Finally *Formicoxenus*. Because of their very specialized inquiline lifeways in the nests of much larger formicine ants *Formicoxenus* species have always presented a problem. Until recently the genus only contained the two Palaearctic species *nitidulus* (Nylander) and *orientalis* Dlussky, and was separated from *Leptothorax* by its possession of a strongly dentate subpostpetiolar process. This postpetiolar development is a common feature in many unrelated inquilines from all parts of the Myrmicinae and is a recognized character of the inquiline syndrome. It should not, by itself, be regarded as being of generic significance. Dissection of *nitidulus* has, however, shown that the mandibles are apparently consistently 6-dentate and the palp formula is reduced to 4,3. These characters, coupled with the 11-segmented antennae (again not a strong character when taken alone) combine to form a reasonable case for maintaining *Formicoxenus* as a genus. An observation in support of this comes from the decision of Buschinger (1979) to transfer the American species *hirticornis* Emery and *diversipilosus* M. R. Smith from *Leptothorax* to *Formicoxenus* on the grounds that their social organization is the same as in the European *nitidulus*, and despite the fact that they lack a strong subpostpetiolar process. Dissection of *hirticornis* has shown a 4,3 palp formula and 6-dentate mandibles as in *nitidulus*. I have not been able to dissect any *diversipilosus* but a similar dentition and palp formula there would reinforce the case for maintaining *Formicoxenus* as a genus separate from *Leptothorax*.

Synonymic list of Afrotropical *Leptothorax* species

- ***angulatus*** Mayr
    - *angulatus* st. *ilgii* Forel **syn. n.**
    - *latinodis* Mayr **syn. n.** (provisional)
    - *angulatus* var. *concolor* Santschi **syn. n.**
- ***braunsi*** (Forel) **comb. n.**
- ***cenatus*** **sp. n.**
- ***denticulatus*** Mayr
- ***evelynae*** Forel
- ***grisoni*** Forel
- ***humerosus*** Emery
- ***innocens*** (Forel)
- ***megalops*** Hamann & Klemm
- ***simoni*** (Emery) **comb. n.**
- ***stramineus*** (Arnold)

Key to species (workers)

1 With the alitrunk in absolute profile the dorsum forming a single uninterrupted surface which is evenly flat or slightly convex, without trace of a metanotal impression and not having the propodeum depressed (Fig. 8) 2

– With the alitrunk in absolute profile the dorsum with the metanotal groove impressed even if only feebly so, or the propodeum depressed below the level of the promesonotum, or both (Figs 14–22) 3

2 Head and body uniform blackish brown to black. (Ghana, Zaire) . . . . . ***grisoni*** (p. 329)

– Head and body uniform yellow. (Extremely widespread) . . . . . ***angulatus*** (p. 324)

3 First gastral tergite everywhere with blunt standing hairs 4

– First gastral tergite either without standing hairs at all or at most with a single transverse row at the apex of the sclerite 9

4 Petiole node narrow in profile, not denticulate (Figs 14–16). Antennal scapes longer, SI 85–110. Eyes larger, maximum diameter 0.30–0.38 × HW 5

– Petiole node broad in profile, denticulate (Figs 18–20). Antennal scapes shorter, SI 68–74. Eyes smaller, maximum diameter 0.24–0.29 × HW 7

5 Anterior pronotal angles projecting as a pair of acute teeth in dorsal view; sides of pronotum sharply marginate. Petiole node sharply triangular in profile (Fig. 16). Scapes relatively shorter and head broader (Fig. 12), SI 85, CI 83. ('East Africa') . . . . . ***humerosus*** (p. 329)

– Anterior pronotal angles evenly bluntly rounded in dorsal view; sides of pronotum not marginate. Petiole node not sharply triangular in profile (Figs 14, 15). Scapes relatively longer and head narrower (Figs 11, 13), SI 107–110, CI 70–78 6

6 Eyes larger, maximum diameter 0.38 × HW. Petiole node in profile without a strongly differentiated posterodorsal angle (Fig. 14). Mandibles almost smooth, with only vestiges of sculpture. (Sudan) . . . . . ***megalops*** (p. 331)

– Eyes smaller, maximum diameter 0.30–0.31 × HW. Petiole node in profile with a strongly differentiated posterodorsal angle (Fig. 15). Mandibles with strong but fine longitudinal rugular sculpture. (Kenya) . . . . . ***cenatus*** (p. 327)

7 Subpetiolar process a tooth anteriorly followed by a long cuticular flange which runs back to the postpetiolar junction (Fig. 19). Eyes with 10–11 ommatidia in the longest row. Larger species, HW 0.62–0.68, PW 0.46–0.52. (South Africa) . . . . . ***denticulatus*** (p. 328)

– Subpetiolar process an anteriorly situated simple tooth or denticle (Figs 18, 20). Eyes with 7–8 ommatidia in the longest row. Smaller species, HW 0.49–0.53, PW 0.35–0.38 8

8 Propodeal spines short and broad, in profile about as long as their basal width, the declivity between the spines and the metapleural lobes concave (Fig. 20). Dorsum of head densely and sharply reticulate-punctate, with traces of fine rugulae. (Zaire) . . . . . ***innocens*** (p. 330)

– Propodeal spines long and narrow, in profile distinctly longer than their basal width and slightly downcurved, the declivity between the spines and the metapleural lobes straight (Fig. 18). Dorsum of head weakly superficially reticulate-punctate, without trace of rugulae. (South Africa) . . . . . ***stramineus*** (p. 332)

9 Propodeum unarmed (Fig. 22). (South Africa) . . . . . ***braunsi*** (p. 325)

– Propodeum armed with a pair of spines or teeth (Figs 17, 21) 10

10 Eye with only 7–8 ommatidia in the longest row. Alitrunk shaped as in Fig. 17. Small yellow species with longer scapes, HW < 0.60, SI > 90. (Ghana, Zaire) . . . . . ***evelynae*** (p. 328)

– Eye with 15–16 ommatidia in the longest row. Alitrunk shaped as in Fig. 21. Large reddish species with darker gaster and shorter scapes, HW > 0.85, SI < 85. (South Africa) . ***simoni*** (p. 331)

The few species constituting the Afrotropical fauna of *Leptothorax* apparently represent outliers derived from a number of different species-groups of extralimital origin, one or two species from each of which have managed to enter the region and to survive there. Because of the unsatisfactory state of the taxonomy of *Leptothorax* the species-group limits have not been worked out, but the 11 species occurring in sub-Saharan Africa aggregate as follows.

L. angulatus and *grisoni*. Metanotal groove absent. SI > 85. Eyes large, with 15 or more ommatidia in the longest row. Pronotal corners acute. Petiole node large, with a short anterior peduncle; the node sculptured but not denticulate. Frontal carinae absent. Median clypeal lobe more or less evenly convex.

L. denticulatus, *innocens* and *stramineus*. Metanotal groove present. SI < 75. Eyes relatively small, with 7–10 ommatidia in the longest row. Pronotal corners blunt. Petiole node large and denticulate, with a moderately long anterior peduncle. Frontal carinae absent and the median clypeal lobe more or less evenly convex.

L. braunsi and *simoni*. Metanotal groove present and the propodeum somewhat depressed below the level of the promesonotum. SI in intermediate range, 78–83. Eyes large, with 16–18 ommatidia in the longest row. Pronotal corners rounded. Petiole node massive and domed, not denticulate and with a moderately long narrow peduncle. Clypeal lobe conspicuously produced; frontal carinae absent.

L. evelynae, *cenatus* and *megalops*. Metanotal groove present but shallow, sometimes very shallow. SI > 90. Eyes relatively small to moderate, with 7–12 ommatidia in the longest row. Pronotal corners bluntly angular to evenly rounded. Petiole node small, without denticles and with a moderately long peduncle. Frontal carinae very feeble to absent and the median clypeal lobe more or less evenly rounded.

L. humerosus. Metanotal groove present. SI 85. Eyes large, with 14–15 ommatidia in the longest row. Pronotal corners sharply dentate, the sides of the pronotum sharply marginate. Petiole node acutely triangular, not denticulate, with a short peduncle. Feeble frontal carinae present and the median clypeal lobe conspicuously produced.

Leptothorax angulatus Mayr

(Figs 8, 9)

Leptothorax angulatus Mayr, 1862: 739. LECTOTYPE worker, EGYPT: 'auf der sinaitischen Halbinsel' (*R. v. Frauenfeld*) (NM, Vienna), here designated [examined].

Leptothorax angulatus st. *ilgii* Forel, 1894: 82. Holotype worker, ETHIOPIA: 'Sudabessinien' (*A. Ilg*) (MHN, Geneva) [examined]. **Syn. n.**

Leptothorax latinodis Mayr, 1895: 130. Holotype worker, MOZAMBIQUE: Delagoa Bay (*H. Brauns*) (not found, presumed lost). **Syn. n.** (provisional).

Leptothorax angulatus var. *concolor* Santschi, 1914*a*: 107, fig. 15. Syntype workers, KENYA: Mómbasa, st. no. 3, x.1911 (*Alluaud & Jeannel*) (NM, Basle) [examined]. **Syn. n.** [Data labels on syntypes read *L.* (*Goniothorax*) *angulatus* var. *concolor*.]

WORKER. TL 3.1–3.8, HL 0.70–0.90, HW 0.56–0.74, CI 75–85, SL 0.50–0.66, SI 88–97, PW 0.40–0.56, AL 0.82–1.08 (65 measured).

Mandibles delicately but densely longitudinally striate, the striation usually distinct but sometimes superficial. Median clypeal lobe extensive, broad, covering the bases of the mandibles and having its anterior margin conspicuously arched-convex. Median clypeal carina fine, not strongly developed but usually discernible, only rarely the carina partially or wholly effaced. Antennal scrobes absent. Frontal carinae absent but in some the frontal lobe followed on one or both sides by a weak rugular line which runs back on the head. Maximum diameter of eyes 0.17–0.22, about 0.27–0.33 × HW and with 13 or more ommatidia in the longest row. With the head in full-face view the sides narrower in front of the eyes than behind, slightly convergent anteriorly. Sides of head behind eyes shallowly convex, slightly convergent posteriorly and meeting the occipital margin in a blunted angle. Occipital margin transverse to very shallowly concave, with a slightly projecting rim above the occipital foramen which is visible in full-face view. With the alitrunk in profile the dorsum forming a single shallowly convex to almost flat surface, without trace of a metanotal impression. Propodeum armed with a pair of triangular teeth or short broad spines of variable size. In general the teeth are about as long as their basal width and slightly upcurved, but individuals with spines longer than their basal width are fairly common. Specimens with the propodeal armament reduced to short broad teeth, where they are shorter than the basal width, are less common. Metapleural lobes low and rounded. In dorsal view the alitrunk with angulate to weakly dentate pronotal corners. Mesonotum narrower than pronotum and the sides of the propodeum diverging to the level of the spiracle and then converging to the bases of the propodeal teeth. Petiole in profile shaped as in Fig. 8, with a short anterior peduncle which has a triangular dentiform anteroventral process. Dorsal surface of peduncle with a denticulate process in front of the level of the spiracle on each side. Anterodorsal angle of node quite sharply defined, the posterodorsal angle much broader and bluntly rounded. Petiole node in dorsal view variable in shape and size. Usually the node about as broad as long, rarely slightly longer than broad but quite commonly obviously broader than long, in some cases approaching the postpetiole in width. Dorsum of head covered with a fine dense reticulate-punctulate ground-sculpture which in some samples is superficial and granular in appearance. Superimposed on this are very fine irregular rugulae which frequently form a narrow reticulum occipitally and sometimes also on the sides of the head. Dorsal surfaces of alitrunk, petiole and postpetiole with fine granular or punctulate ground-sculpture and with disorganized fine rugulae. The rugular sculpture is usually distinctive but in some individuals may be partially effaced. Base of first gastral tergite generally with a superficial reticular pattern but sometimes almost completely smooth. All dorsal surfaces of head and body with numerous short stout blunt hairs; such hairs absent from the appendages. Colour yellow, frequently with the antennal club darker.

L. angulatus is the most widely distributed and commonest species of this genus in sub-Saharan Africa. It is easily identified by its yellow colour and lack of any trace of a metanotal groove or impression. Only one other species in the region lacks a metanotal groove, *grisoni*, but in this species the full adult colour is uniform blackish brown or black.

Arnold (1916: 259) noted that he only found *angulatus* on the trunks of trees but personal observation has shown that it also occurs in leaf litter samples and log mould. However, the species does seem to prefer to nest clear of the ground when possible, as colonies are often found in West Africa in cocoa pods which are still attached to the tree, and the sample from Malawi noted below was collected in *Swartzia* pods.

MATERIAL EXAMINED

Egypt: Sinai (*Frauenfeld*). **Ghana:** Legon (*D. Leston*); Tafo (*B. Bolton*); Tafo (*C. A. Collingwood*); Adeiso (*P. Room*); Adeiso (*D. Leston*). **Nigeria:** Gambari (*B. Taylor*). **Ethiopia:** 'Sudabessinien' (*A. Ilg*). **Sudan:** Equatoria (*N. A. Weber*); Port Sudan (*N. A. Weber*); Nile above Khartoum (*N. A. Weber*). **Kenya:** Nairobe (*Patrizi*); Mombasa (*Alluaud & Jeannel*); Tana Riv., Wema (*V. Mahnert & J.-L. Perret*). **Tanzania:** Dar es Salaam (*N. L. H. Krauss*). **Malawi:** nr Salima (*B. J. S.*). **Zimbabwe:** Victoria Falls (*G. Arnold*); Melsetter (*G. Arnold*); Khami Riv. (*G. Arnold*). **Botswana:** Maxwee (*A. Russell-Smith*). **South Africa:** Natal, St Lucia (*J. C. Faure*).

Leptothorax braunsi (Forel) **comb. n.**

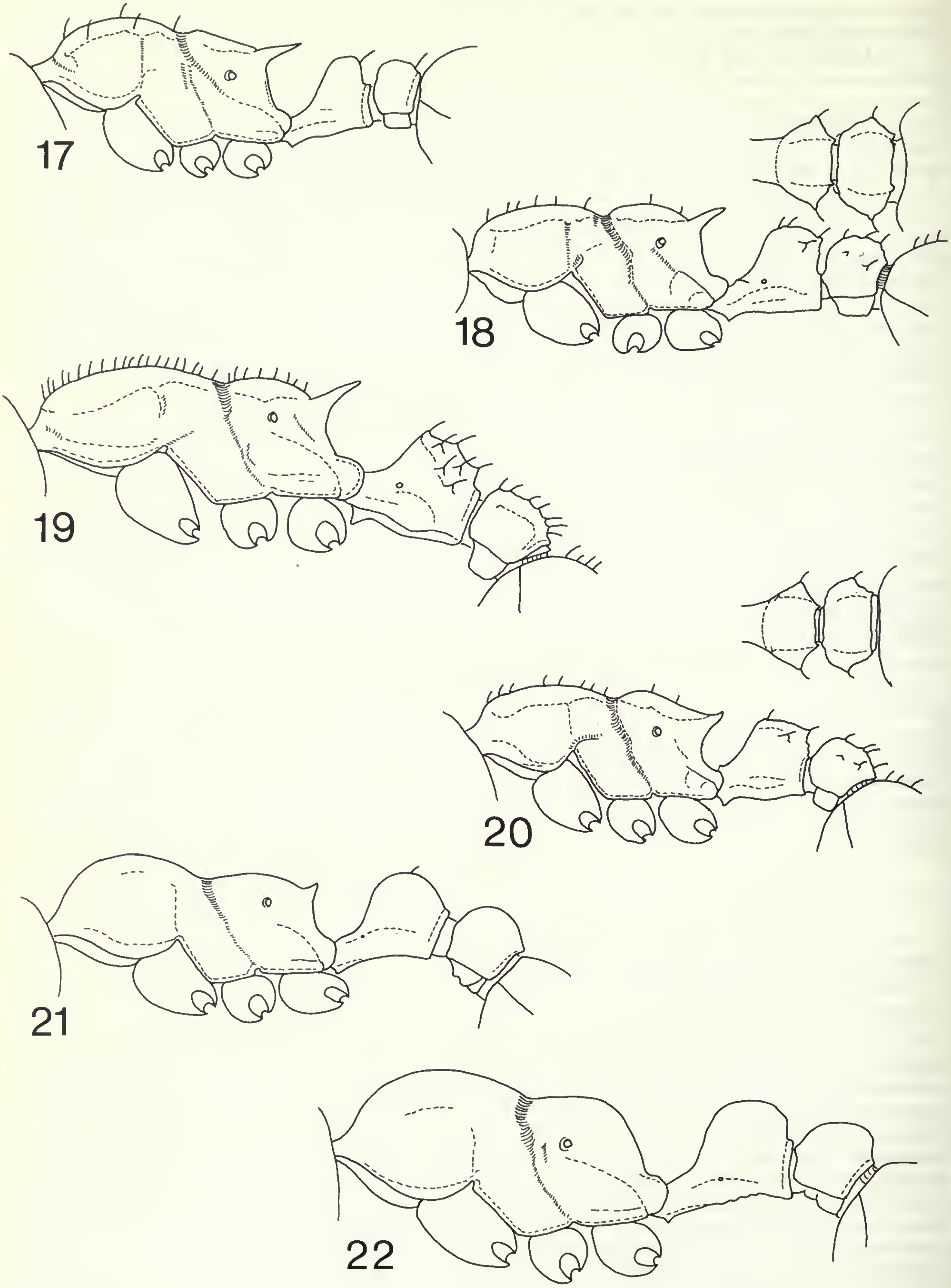
(Figs 10, 22)

Dilobocondyla (*Tetramyrma*) *braunsi* Forel, 1912: 767. Holotype worker, SOUTH AFRICA: Cape Colony, Willowmore (*H. Brauns*) (BMNH) [examined].

Tetramyrma braunsi (Forel) Forel, 1913*b*: 122. [See also Bolton, 1976: 291.]

WORKER. TL 5.2–5.9, HL 1.20–1.36, HW 1.00–1.16, CI 83–86, SL 0.82–0.94, SI 79–83, PW 0.78–0.96, AL 1.44–1.62 (9 measured).

Mandibles finely longitudinally striate, the spaces between striae finely punctulate or shagreened; the striate sculpture sometimes inconspicuous. Median lobe of clypeus prominent (Fig. 10), its anterior margin shallowly and evenly convex. Frontal carinae and antennal scrobes absent, the scapes of moderate length (SI above). Maximum diameter of eye 0.28–0.31, about 0.26–0.29 × HW and with 16–18 ommatidia in the longest row. In full-face view the head shaped as in Fig. 10. Alitrunk and pedicel segments in profile as in Fig. 22, the promesonotum evenly convex, the metanotal groove not or only slightly impressed but the propodeal dorsum distinctly depressed below the level of the promesonotum. Propodeum absolutely unarmed, the dorsum rounding evenly into the declivity. In dorsal view the pronotal corners rounded, the promesonotum narrowing posteriorly. Metapleural lobes rounded. Node of petiole in profile massive, with a relatively narrow anterior peduncle which has a dentiform anteroventral process. In dorsal view the petiole node subglobular, slightly broader than long; postpetiole broader than long and broader than the petiole. Dorsum of head longitudinally rugulose with a few cross-meshes, occipitally a weak reticulum may be



Figs 17–22 *Leptothorax* workers. Alitrunk and pedicel segments of (17) *evelynae*, (18) *stramineus*, (19) *denticulatus*, (20) *innocens*, (21) *simoni*, (22) *braunsi*.

formed. Sides of head above and behind eyes generally more obviously reticulate than the dorsum. Dorsal alitrunk irregularly rugose, the sculpture quite strong, usually forming a reticulum on the propodeum and anterior pronotum. Petiole and postpetiole irregularly reticulate-rugose. First gastral tergite densely punctulate or shagreened, the sculpture generally strongest basally and usually traces of very fine longitudinal costulae may be seen. A few short inconspicuous erect hairs present on dorsum of head but the dorsal alitrunk, petiole and postpetiole hairless. First gastral tergite without standing hairs but with a short fine appressed sparse pubescence. Appendages without standing hairs. Head and gaster dark brown tinged with red to reddish black; alitrunk and pedicel segments red, the two colours strongly contrasting in fresh specimens.

This large and conspicuous South African species is easily recognized by its large size, unarmed propodeum, lack of hairs on alitrunk and first gastral tergite and depressed propodeal dorsum. The closest related species in sub-Saharan Africa is *simoni*, but here the propodeum is distinctly bidentate.

MATERIAL EXAMINED
South Africa: Cape Prov., Willowmore (*H. Brauns*).

Leptothorax cenatus sp. n.

(Figs 11, 15)

HOLOTYPE WORKER. TL 3.6, HL 0.78, HW 0.60, CI 77, SL 0.64, SI 107, PW 0.47, AL 0.98.

Mandibles finely but strongly longitudinally rugulose. Anterior clypeal margin convex and concealing the basal tooth of the mandibles. Median clypeal carina feebly developed, weaker than the more laterally situated clypeal carinae, which converge anteriorly. The anteriormost clypeal carina runs across the clypeus in an unbroken transverse arc just behind the anterior margin, terminating at the antennal fossa on each side. Frontal carinae represented by a pair of feeble meandering rugula-like ridges which run back from the narrow frontal lobes to a point behind the level of the posterior margins of the eyes; these carinae scarcely stronger than the rugular sculpture of the head and merging with that sculpture posteriorly. Antennal scrobes absent, the scapes relatively long, SI > 100. Eyes quite large, maximum diameter 0.18, about 0.30 × HW and with 11 ommatidia in the longest row. With the head in full-face view the occipital margin shallowly transversely convex, the occipital corners rounded. With alitrunk in dorsal view the pronotal corners rounded. With alitrunk in profile the promesonotum shallowly evenly convex, the metanotal area broadly but shallowly impressed and the propodeum armed with a pair of acute narrow spines. Metapleural lobes very low, rounded. Petiole in profile with a moderately long anterior peduncle, the dorsal surface of which is confluent with the anterior face of the node, the two not separated by an angle. Node with well developed antero- and posterodorsal angles, the dorsum between them more or less flat. In dorsal view the dorsum of the petiole node broader than long, and the petiole narrower than the postpetiole. Dorsum of head with fine, widely spaced, irregular rugulae which are predominantly longitudinal. Occipitally the rugulae are more sharply defined and have a few cross-meshes, although no reticulation is developed. Spaces between rugulae smooth or at most with only vestiges of ground-sculpture. Sides of head above eyes sculptured as dorsum but both in front of and behind the eyes the rugulae are more crowded and tend to form a loose reticulum. Promesonotal dorsum finely and predominantly longitudinally rugulose, with very sparse cross-meshes. The rugulae widely spaced and with a ground-sculpture of extremely fine superficial punctulae between them, which in places is almost effaced. Rugulae present on propodeal dorsum but weaker than on promesonotum. Petiole and postpetiole with fine superficial shagreening and a few weak inconscpicuous rugulae. First gastral tergite unsculptured except for hair-pits. All dorsal surfaces of head and body with numerous stout blunt mainly straight hairs which are shorter and more erect on the head than on the first gastral tergite. Legs and scapes without such hairs. Dorsum of head brown, remainder of body dull yellow with a brown tint, especially on the petiole and postpetiole which are somewhat darker than the alitrunk and gaster but not as dark as the head.

PARATYPE WORKER. TL 3.2, HL 0.74, HW 0.58, CI 78, SL 0.62, SI 107, PW 0.42, AL 0.90.

As holotype but slightly smaller, maximum diameter of eye 0.18, about 0.31 × HW and with 10 ommatidia in the longest row.

Holotype worker, **Kenya:** Lake Nakuru, Nat. Park, 6.xi.1974, leaf litter (*V. Mahnert*) (MHN, Geneva).

Paratype. 1 worker, **Kenya:** Nakuru, Lake Elmenteita, 7.xi.1977, 1800 m (*V. Mahnert & J.-L. Perret*) (BMNH).

L. cenatus is closest related to *megalops* but differs in having smaller eyes and a differently shaped petiole node (compare Figs 11, 13 and 14, 15).

Leptothorax denticulatus Mayr

(Fig. 19)

Leptothorax denticulatus Mayr, 1901: 5. Syntype workers, female, SOUTH AFRICA: Cape Prov., Port Elizabeth (*H. Brauns*) (NM, Vienna) [examined].

WORKER. TL 3.1–3.5, HL 0.74–0.84, HW 0.62–0.68, CI 81–85, SL 0.46–0.48, SI 71–74, PW 0.46–0.52, AL 0.82–0.94 (8 measured).

Mandibles finely shagreened to virtually smooth. Anterior margin of median lobe of clypeus evenly arched-convex; median clypeal carina present and usually quite distinct. Frontal carinae absent; antennal scrobes absent. Maximum diameter of eye 0.16–0.19, about 0.26–0.29 × HW and with 10–11 ommatidia in the longest row; the eye in profile only very slightly longer than high. With the head in full-face view the occipital margin straight to feebly convex, rounding evenly into the sides; the latter slightly narrower in front of the eyes than behind and feebly convergent anteriorly. With the alitrunk in profile the promesonotum shallowly convex dorsally, the metanotal groove impressed and the propodeal dorsum convex. Propodeum armed with a pair of strong spines which are longer than their basal width. Metapleural lobes rounded. In dorsal view the alitrunk with the pronotal corners bluntly angular to narrowly rounded. Petiole node in profile large and blocky (Fig. 19), the upper sides and dorsum with numerous peaks or denticles from which hairs arise. Peduncle of petiole short and broad, subtended by an extensive ventral process which takes the form of a triangular denticle or tooth anteriorly, followed by a long cuticular ridge which runs back to the junction with the postpetiole. In ventral view the subpetiolar ridge is seen to fork at about its midlength, forming an inverted Y-shape. With the pedicel segments in dorsal view the denticles conspicuous on the sides of both the petiole and postpetiole; both segments broader than long, the latter somewhat broader than the former. Dorsum of head covered with a blanket of fine dense punctulate ground-sculpture which is overlaid everywhere by dense and very fine rugular sculpture. On the dorsum the rugulae are close and longitudinal but on the sides, above the eyes and occipitally there is a tendency for a narrow reticulum to be formed. Dorsal alitrunk reticulate-punctate and with fine rugulae which are predominantly longitudinal; on the promesonotum a reticulum may be formed anteriorly and in some the rugulae are quite strongly developed. Sculpture of petiole and postpetiole dorsally predominantly reticulate-punctate but a few fine rugulae may be present. Base of first gastral tergite superficially reticulate to almost smooth. All dorsal surfaces of head and body densely and evenly clothed with short blunt hairs; the appendages without such hairs. Colour uniform yellow, sometimes the posterior half of the gaster darker than the anterior half.

Among the species in which the metanotal groove is impressed three, *denticulatus*, *innocens*, and *stramineus*, have the petiole node bearing denticles from which hairs arise. Of the three *denticulatus* is recognized by its strongly developed subpetiolar process, dense pilosity, larger eyes and larger size.

MATERIAL EXAMINED

South Africa: Cape Prov., Barrydale (*H. V. Daly*); Port Elizabeth (*H. Brauns*).

Leptothorax evelynae Forel

(Fig. 17)

Leptothorax (*Goniothorax*) *evelynae* Forel, 1916: 423. Syntype workers, female, ZAIRE: St Gabriel (*Kohl*) (MHN, Geneva) [examined].

WORKER. TL 2.5–2.9, HL 0.58–0.70, HW 0.47–0.54, CI 77–81, SL 0.44–0.52, SI 92–98, PW 0.35–0.44, AL 0.65–0.82 (7 measured).

Mandibles finely shagreened. Median clypeal lobe evenly arched-convex. Median clypeal carina present but fine, incomplete in a few specimens. Frontal carinae and antennal scrobes absent. Antennal scapes relatively long, SI > 90. Maximum diameter of eye 0.12–0.16, about 0.26–0.29 × HW and with 7–8 ommatidia in the longest row. With the alitrunk in profile the metanotal groove shallowly but conspicuously impressed, the promesonotum evenly shallowly convex and the propodeal dorsum almost flat to shallowly convex. Propodeal spines straight, distinctly longer than their basal width. Metapleural lobes low and rounded. In dorsal view the alitrunk with the pronotal corners angulate and the sides of the promesonotum bluntly marginate. The dorsal surface gradually narrows from front to back but the sides of the mesonotum are slightly convex and the sides of the propodeum diverge from the metanotal groove to the level of the spiracle and then converge to the bases of the spines. Petiole in profile with a high narrow node (Fig. 17) which is not equipped with denticles. Ventral process of peduncle a simple small tooth, anteriorly situated. In dorsal view the petiole node broader than long. Dorsum of head with fine superficial reticulate-punctate ground-sculpture which is overlaid by a very fine narrow reticulate-rugulose net everywhere except in the area immediately behind the frontal lobes. Dorsal alitrunk with superficial punctulate ground-sculpture overlaid by fine rugulae. In specimens from Zaire this rugular sculpture is faint and weakly developed, forming a reticulum only on the anterior pronotum, but in material from Ghana the rugulae are more strongly developed everywhere and reticular meshes are frequent. Petiole and postpetiole finely punctulate or granular dorsally, sometimes with one or two fine rugulae. Base of first gastral tergite very lightly shagreened or with a superficial reticular pattern. Dorsum of head with scattered short stout blunt hairs. Similar hairs are present on the pronotum (several pairs), mesonotum (1–3 pairs), petiole and postpetiole (1–2 pairs each) but are absent from the propodeum and absent from the first gastral tergite except for a transverse row at the extreme apex. Gastral segments behind the first also with a transverse apical row each. Colour yellow.

The characteristic distribution of the body hairs renders *evelynae* quickly recognizable among the African *Leptothorax* species. The lack of hairs on the propodeum and first gastral tergite is paralleled only in *simoni* and *braunsi*, but these are both much larger ($HW > 0.85$), darker coloured species with much more massively developed petiole nodes and shorter antennal scapes ($SI < 85$). The closest related species appears to be *megalops*, but here the eyes are larger and the propodeum and first gastral tergite both have hairs present.

MATERIAL EXAMINED
Ghana: Tafo (*B. Bolton*). **Zaire:** St Gabriel (*Kohl*).

Leptothorax grisoni Forel

Leptothorax (*Goniothorax*) *grisoni* Forel, 1916: 425. Syntype workers, male, ZAIRE: St Gabriel (*Kohl*) (MHN, Geneva; MCZ, Cambridge) [examined].

WORKER. TL 2.9–3.4, HL 0.76–0.86, HW 0.60–0.66, CI 77–81, SL 0.56–0.63, SI 94–98, PW 0.46–0.53, AL 0.85–1.02 (9 measured).

Answering to the description of *angulatus*, differing only in colour and intensity of sculpture. In *grisoni* the full adult colour is uniform blackish brown to black, as opposed to the uniform yellow found in *angulatus*. The dorsum of the head and alitrunk in *grisoni* is blanketed by a dense reticulate-punctate ground-sculpture which is overlaid by conspicuous fine rugulae which form a distinct reticulum on the alitrunk and on much of the head. Basically this sculpture is the same as that seen in *angulatus*, but here it is more intensely and sharply developed.

Although these seem relatively minor differences I am prepared to accept them as valid for the present. The reason for this is that the two colour forms have ranges which only partially overlap. The yellow *angulatus* is known from most of the continent from Ethiopia and Sudan to South Africa and Botswana, but the dark *grisoni* has only been found in Ghana and Zaire. *L. angulatus* also occurs in Ghana in the same areas where *grisoni* has been discovered, but even here the two maintain their distinctive colours, no intermediates being known.

MATERIAL EXAMINED
Ghana: Tafo (*B. Bolton*); Kade (*J. Majer*); Asamankese (*P. Room*). **Zaire:** St Gabriel (*Kohl*).

Leptothorax humerosus Emery

(Figs 12, 16)

Leptothorax humerosus Emery, 1896: 62. Holotype worker, 'AFRICA ORIENTALE': no loc. (*Staudinger & Bang-Haas*) (MCSN, Genoa) [examined].

WORKER. TL 3.7, HL 0.90, HW 0.75, CI 83, SL 0.64, SI 85, PW 0.52, AL 0.98.

Mandibles almost smooth, with only vestigial traces of superficial sculpture. Median lobe of clypeus strongly produced, roughly rectangular, its anterior margin transverse and flat; the anterior margin meeting the sides of the lobe in a distinct angle. Median clypeal carina absent. Narrow weakly differentiated frontal carinae present which are scarcely stronger than the remaining cephalic sculpture but which reach back well beyond the level of the posterior margins of the eyes. Antennal scrobes absent. Antennal scapes moderately long, SI 85. Maximum diameter of eye 0.24, about 0.32 × HW and with 14–15 ommatidia in the longest row. With the head in full-face view the sides narrower in front of the eyes than behind and somewhat convergent anteriorly. Sides behind eyes rounding evenly into the occipital margin, the latter shallowly and evenly transversely convex. Pronotum sharply marginate laterally, the anterior pronotal corners dentate. With the alitrunk in profile the promesonotum convex, the metanotal groove deeply impressed. Propodeum broadly and evenly convex in profile, sloping down posteriorly to the long spines; the latter blunt apically and with their dorsal margins angled (Fig. 16). Metapleural lobes low and rounded. Petiole in profile with the node triangular, rising to an acute peak above; anterior peduncle of petiole short. In dorsal view the sides of the petiole roughly parallel. Postpetiole much broader than petiole. Basal face of first gastral tergite transverse except for a median concavity where it articulates with the postpetiole. Dorsum of head everywhere sculptured with fine longitudinal rugulae and with a fine granular to punctulate superficial ground-sculpture. Dorsal alitrunk with ground-sculpture similar to head. Pronotum also with 7–8 broad, coarse longitudinal rugae which are almost sulcate in appearance and are most strongly developed anteriorly. These longitudinal rugae are continuous over the length of the promesonotum and also traverse the base of the metanotal groove, but they either fade out or become very weakly defined on the propodeum where a punctulate ground-sculpture predominates. Petiole and postpetiole finely and densely reticulate-punctulate, the first gastral tergite very densely finely shagreened and opaque. All dorsal surfaces of head and body with distinctive short stout blunt hairs. Body colour more or less uniform medium brown but the mandibles, clypeal lobe and antennae yellow. Propodeal spines yellowish, lighter in colour than the propodeum itself.

This very distinctive species is easily separable from all other known African forms by its flat-margined clypeal lobe, deep metanotal groove, large eyes, sharply marginate pronotum with dentate corners and sharply triangular petiole node. It is not obviously related to any other species of *Leptothorax* in the region and, as far as is known, is only represented in collections by the holotype.

MATERIAL EXAMINED

'East Africa': no loc. (*Staudinger & Bang-Haas*).

Leptothorax innocens (Forel)

(Fig. 20)

Tetramorium (*Leptothorax*?) *innocens* Forel, 1913*a*: 317. Holotype worker, ZAIRE: Katanga, Elizabethville (= Lubumbashi) (*Bequaert*) (MHN, Geneva) [examined].
Leptothorax innocens (Forel) Forel, 1916: 425.

WORKER. TL 2.3–2.5, HL 0.60–0.62, HW 0.49–0.50, CI 81–82, SL 0.34–0.35, SI 69–70, PW 0.35–0.36, AL 0.66–0.68 (2 measured).

Mandibles extremely finely and delicately superficially shagreened, almost smooth. Median portion of clypeus with anterior margin evenly arcuate-convex, with a narrow cuticular apron. Median clypeal carina vestigial to absent. Frontal carinae and antennal scrobes absent, the scapes short. Maximum diameter of eye 0.12–0.13, about 0.24–0.26 × HW and with 7–8 ommatidia in the longest row. With the head in full-face view the sides narrower in front of the eyes than behind and somewhat convergent anteriorly. Behind the eyes the sides very slightly convex and rounding into the occipital corners, the occipital margin itself very feebly impressed medially to almost straight. With the alitrunk in profile the promesonotum shallowly convex, the metanotal groove impressed and the propodeum convex, more strongly so than the promesonotum. Propodeal spines broadly triangular and stout, about as long as their basal width. Propodeal declivity concave between the spines and the rounded low metapleural lobes. In dorsal view the alitrunk with the pronotal shoulders obtusely and bluntly rounded, the promesonotum narrowing to the metanotal groove. Behind this the sides of the propodeum diverge to about the level of the spiracle, pass through an obtuse angle and then converge again to the bases of the spines. Petiole in dorsal view with a tubercle at either side of the node and the posterior margin of the node with a much smaller and inconspicuous pair of tubercles. Petiole in profile with a short anterior peduncle which has a small triangular process ventrally. Dorsal surfaces of head, alitrunk, petiole and postpetiole finely densely sharply reticulate-punctate, the promesonotum and head also with traces of fine rugular sculpture. First gastral tergite basally with very delicate superficial shagreening. All dorsal surfaces of head and body with numerous very short blunt hairs; legs and scapes without standing hairs. Colour uniform yellow.

This small species is closest related to *stramineus* but the two are separated by the characters given in the key and noted under the discussion of *stramineus*.

MATERIAL EXAMINED

Zaire: Katanga, Elizabethville (*Bequaert*).

Leptothorax megalops Hamann & Klemm

(Figs 13, 14)

Leptothorax (*Icothorax*) *megalops* Hamann & Klemm, 1967: 417, fig. 1. Holotype worker, and paratype female, SUDAN: Wadi Halfa, 28.i.1962 (*H. Hamann & W. Klemm*) (NM, Vienna) [examined].

WORKER. TL 2.5, HL 0.67, HW 0.47, CI 70, SL 0.52, SI 110, PW 0.35, AL 0.72.

Mandibles almost smooth, with faint vestiges of superficial sculpture. Median lobe of clypeus prominent, its anterior margin evenly but shallowly convex. Median clypeal carina present, fine but distinct. Frontal carinae and antennal scrobes absent. Head relatively longer and narrower and scapes relatively longer than any other known species of the region (CI and SI above). Eyes relatively large, maximum diameter 0.18, about 0.38 × HW and with 11–12 ommatidia in the longest row. With the head in full-face view the occipital margin feebly indented medially, rounding broadly and evenly into the sides; the latter approximately parallel but converging slightly anteriorly. Alitrunk in profile with the metanotal groove shallowly impressed, the propodeal spines short, stout and straight. Metapleural lobes low and rounded, the declivity between the spines and the metapleural lobes more or less straight. In dorsal view the pronotal angles broadly and evenly rounded. Petiole in profile with the node bluntly triangular (Fig. 14), the anteroventral process small and triangular. Dorsum of head with fine longitudinal rugulae the spaces between which are smooth or at most only faintly superficially punctulate. Dorsal alitrunk with more conspicuous punctulate ground-sculpture which is overlaid by fine, predominantly longitudinal rugulae, although these are irregular in places. Petiole and postpetiole finely punctulate with traces of fine rugulae. First gastral tergite unsculptured. All dorsal surfaces of head and body with quite long blunt hairs which are, however, shorter on the head than on the alitrunk; the appendages without such hairs. Colour uniform yellow.

This very conspicuous species is easily recognized by its long narrow head, long scapes, large eyes, rounded pronotal corners and lack of denticles on the petiole node, coupled with its impressed metanotal groove and possession of hairs on the first gastral tergite. The closest relatives of *megalops* in the Afrotropical region are *evelynae* and *cenatus*. Both are distinguished from *megalops* quite easily as the former lacks pilosity on the first gastral tergite except for a sparse apical row, and the latter has strongly sculptured mandibles, smaller eyes and a broader head, and has the petiole node differently shaped (Figs 14, 15).

MATERIAL EXAMINED

Sudan: Wadi Halfa (*Hamann & Klemm*).

Leptothorax simoni (Emery) **comb. n.**

(Fig. 21)

Tetramorium simoni Emery, 1895*b*: 35, pl. 2, fig. 22. Lectotype worker, SOUTH AFRICA: Transvaal, Makapan (*E. Simon*) (MCSN, Genoa), designated by Bolton, 1976: 292 [examined].

Tetramyrma simoni (Emery) Emery, 1922*a*: 291. [See also Bolton, 1976: 291.]

WORKER. TL 4.7, HL 1.10, HW 0.92, CI 84, SL 0.72, SI 78, PW 0.74, AL 1.32.

Mandibles with faint longitudinal sculpture and scattered pits. Median lobe of clypeus prominent, its anterior margin shallowly convex. Median clypeal carina distinct. Frontal carinae and antennal scrobes absent, the scapes of moderate length. Maximum diameter of eye 0.29, about 0.32 × HW and with 17–18 ommatidia in the longest row. With the head in full-face view the occipital margin shallowly convex centrally, more steeply convex laterally where it rounds into the sides. With the alitrunk in profile the promesonotum evenly convex, sloping down posteriorly to the shallow metanotal groove. Propodeal dorsum more shallowly convex than the promesonotum and strongly depressed below the level of the promesonotum (Fig. 21). Propodeum armed with a pair of teeth which are slightly shorter than the rounded metapleural lobes. Petiole node massive, domed in profile, the anterior peduncle short and narrow, equipped with a dentiform anteroventral process. In dorsal view both petiole and postpetiole inflated, broader than long. Dorsum of head finely and predominantly longitudinally rugulose, with scattered cross-meshes. On the sides of the head and occipitally a loose reticulum is present. Ground-sculpture between the rugulae a fine dense punctulation, superficial in places. Dorsal surfaces of alitrunk, petiole and postpetiole reticulate-rugose, the meshes narrower and usually more sharply defined on the propodeum and pedicel segments than on the promesonotum. Fine punctulate ground-sculpture present everywhere but stronger on the pedicel segments than on the promesonotum. Base of first gastral tergite finely and very densely reticulate-punctulate, the sculpture weakening posteriorly on the sclerite. Extreme base of first tergite, just behind the postpetiolar articulation, with very short but strongly developed costulae. Short erect hairs very sparse on dorsum of head, absent from all other surfaces except the petiole where a single pair is present. Hairs absent from appendages. Sparse short decumbent to appressed pubescence present on alitrunk and first gastral tergite; hairs present on tergites of gaster behind the first. Head and gaster dark brown with a dull reddish tinge, alitrunk and pedicel segments dull red. Mandibles yellow.

A distinctive species characterized by its large size, depressed propodeum, lack of standing hairs on the first gastral tergite, large eyes and short propodeal teeth. The closest relative of *simoni* is *braunsi*, but in the latter the propodeum is unarmed (Figs 21, 22).

MATERIAL EXAMINED

South Africa: Transvaal, Makapan (*E. Simon*).

Leptothorax stramineus (Arnold)

(Fig. 18)

Limnomyrmex stramineus Arnold, 1948: 223, figs 10, 10a, 10b. Holotype worker, SOUTH AFRICA: Natal, Zululand, St Lucia Lake (*J. C. Faure*) (NM, Bulawayo) [examined].

Leptothorax (*Nesomyrmex*) *stramineus* (Arnold) Brown, 1971: 4.

WORKER. TL 2.8, HL 0.63, HW 0.53, CI 84, SL 0.36, SI 68, PW 0.38, AL 0.68.

Mandibles very delicately shagreened, almost smooth. Median portion of clypeus with anterior margin evenly arcuate-convex, with a very narrow cuticular apron. Median clypeal carina vestigial. Frontal carinae and antennal scrobes absent, the antennal scapes short. Maximum diameter of eye 0.13, about 0.25 × HW and with 7–8 ommatidia in the longest row. Sides of head behind eyes very feebly convex, the sides narrowing in front of the eyes so that the width immediately in front of the eyes is 0.47 and across the clypeus at its widest is 0.38 (compare with HW 0.53). Occipital margin approximately straight and the occipital corners evenly rounded. Alitrunk in profile with promesonotum evenly and shallowly convex, the propodeal dorsum on the same level but shorter and more strongly convex, the two convexities separated by the conspicuously impressed metanotal groove. Propodeal spines narrow and somewhat downcurved along their length, longer than their basal widths. Slope of the declivity between the spines and the rounded metapleural lobes straight. In dorsal view the alitrunk with the pronotal shoulders obtusely and bluntly angled, the promesonotum narrowing posteriorly to the metanotal groove. Behind this the propodeum broadening to the level of the spiracle then narrowing again to the bases of the spines; the latter divergent and in the holotype with the right spine slightly longer than the left. Petiole node in dorsal view with a strong lateral tubercle on each side, a pair of smaller tubercles on the posterior margin and a very feeble pair anterodorsally which are almost effaced. Postpetiole with a low but broad lateral tubercle on each side. In profile the petiole peduncle short, with a small triangular anteroventral process and with a very small sub-denticulate process dorsally. The node itself higher than long, the lateral and posterior tubercles distinct. Sides of first gastral tergite in dorsal view curving evenly away from the articulation with the postpetiole, without a sharp, flattened appearance. Head, alitrunk, petiole and postpetiole very finely and very densely superficially reticulate-punctulate, without rugulose sculpture. First gastral tergite with only the faintest vestiges of superficial sculpture basally. Dorsal surfaces of head and body with scattered very short blunt stout hairs; such hairs absent from appendages and sides of head but one or two may project from the curved part of the occipital corner on each side. Colour uniform pale yellow.

Among the species which have the metanotal groove impressed *stramineus* is most closely related to *innocens*, the two species sharing the characters of relatively small eyes and having short hairs on the first gastral tergite (as opposed to the first gastral tergite being hairless). In fact, *stramineus* and *innocens* form an extremely close species-pair and may eventually prove to be expressions of a single species. For the present the two may be separated as the sculpture in *innocens*, although punctulate as in *stramineus*, is much more strongly developed and sharply defined, with traces of rugular sculpture also present at least on the head. Besides this the petiolar tubercles are not as strongly developed in *innocens* as they are in *stramineus*, and the propodeal spines are shorter and broader (Figs 18, 20).

MATERIAL EXAMINED

South Africa: Natal, St Lucia Lake (*J. C. Faure*).

MELISSOTARSUS Emery

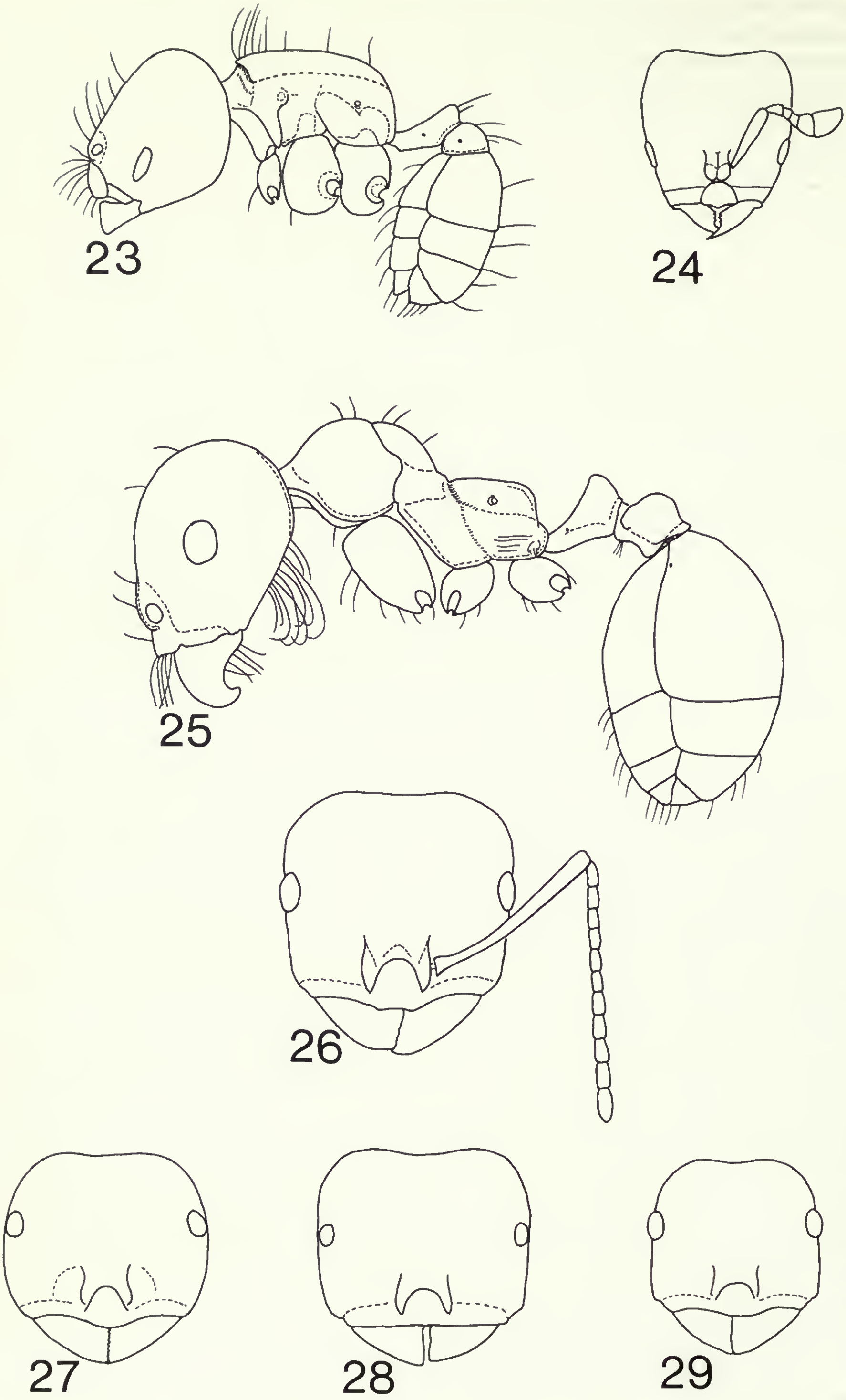
(Figs 23, 24)

Melissotarsus Emery, 1877: 378. Type-species: *Melissotarsus beccarii* Emery, 1877: 379, fig., by monotypy.

DIAGNOSIS OF WORKER. Myrmicine ants with moderate to conspicuous size variation in most nest samples, living under bark and in wood of live trees; general appearance as in Figs 23, 24. Mandibles short, when unworn armed with a long finger-like apical tooth followed by two much smaller teeth and sometimes also by a minute basal denticle. With wear these gradually become an undifferentiated blunt margin. Palp formula 0,1 (*weissi*). Median portion of clypeus bluntly triangular in shape and somewhat raised, not projecting back between the frontal lobes. Lateral portions of clypeus simple and unmodified. Frontal lobes narrow, confluent centrally and separated only by a narrow impressed line; the anteriormost parts of the frontal lobes abut the posterior clypeal margin. Antennal scrobes absent. Frontal carinae absent. Antennae with six segments, the scapes very short (SI 39–47), the two apical segments forming a strong club. Eyes present, distinctly longer than broad and set in front of the midlength of the sides. Alitrunk short, fusiform and box-like, without dorsal sutures or impressions except in the very largest individuals where rarely a metanotal impression is shallowly present. Propodeum unarmed and rounded. Metapleural lobes absent. Lateral portions of pronotum reduced to a narrow V-shaped wedge below the level of the conspicuous mesothoracic spiracle. Anterior coxae small, much smaller than the massively developed middle and hind coxae. Propodeal spiracle round, situated low on the side of the propodeum and just behind its midlength. Metapleural gland system easily visible through the cuticle. Basitarsal segment of each leg greatly swollen, as wide as the preceding tibia, terminating apically in a circlet of small teeth on the anterior (leading) edge on the middle and hind basitarsi. Petiole with an anterior peduncle and a small low posteriorly situated node which is broadly attached to the postpetiole; the latter broadly attached to the gaster. Dorsal alitrunk finely longitudinally costulate throughout. Elongate fine hairs present dorsally on head and body, and also present on the upper surfaces of the scapes and outer surfaces of the tibiae.

This small genus, of which only four uncommon species are presently recognized, is restricted to the Malagasy region (1 species) where it is rare, and the Afrotropical region (3 species) where it is, however, very widespread. The species nest in the healthy wood of living trees, apparently tunnelling their own galleries below the surface. For this reason most collections of *Melissotarsus* are made more by luck than by intent as their presence in the wood is usually not detectable on the surface. Delage-Darchen (1972) has shown that the method of walking in these ants is very strange; they progress on their front and hind legs with the middle pair projecting upwards, and presumably in contact with the gallery roof. She also noted the presence of coccids inside the galleries, also discussed by Ben-Dov (1978). It seems probable that coccid secretions form a major, if not the main, item in the diet of *Melissotarsus* species.

The genus most closely related to *Melissotarsus* is *Rhopalomastix* Forel, represented by three or four poorly defined species distributed throughout the Oriental and Indo-Australian zoogeographical regions and utilizing the same lifeway as *Melissotarsus*. Since Emery (1922*a*) and Wheeler (1922) produced their classifications these two small genera have always been placed together in a tribe of their own (Melissotarsini) and it is fairly certain that they represent two stages on a single adaptive line. *Rhopalomastix* is the more generalized of the two, *Melissotarsus* decidedly the more specialized, but the modifications seen in the latter are foreshadowed in the former genus. It is the accentuation of these adaptive specializations which separates the genera, as follows.



Figs 23–29 23, 24, profile and head of *Melissotarsus weissi*. 25–29, *Messor* workers. 25, profile of *angularis*. 26–29, heads of (26) *angularis*, (27) *striatifrons*, (28) *decipiens*, (29) *denticornis*. Pilosity omitted from 24, 26–29.

Rhopalomastix	*Melissotarsus*
Antennae 10-segmented.	Antennae 6-segmented.
Lateral portion of pronotum extensive, distinctly larger than the mesopleuron.	Lateral portion of pronotum very reduced, forming a V-shaped narrow wedge which is smaller than the mesopleuron.
First coxa as large as or larger than the second and third coxae.	First coxa much smaller than the swollen second and third coxae.
Petiole sub-sessile, with a strong ventral process.	Petiole short-pedunculate, with feeble or no ventral process.
Free posterior face of petiole node long, its articulation with the postpetiole narrow.	Free posterior face of petiole node very short, its articulation with the postpetiole very broad.
Basitarsal segment of each leg not swollen, without apical circlets of teeth.	Basitarsal segment of each leg strongly swollen, with apical circlets of teeth.
Sting long and strong.	Sting very reduced and probably non-functional.

So little material of *Melissotarsus* is available at present that this survey must be regarded as strictly preliminary. Three species are now recognized in the Afrotropical region but it is possible that each may be compounded of more than one different sibling-species. Conversely it is by no means impossible that further collections will bridge what appear here as species for the differences between them, though consistent in the few samples to hand, are relatively minor and may well be anulled by further collecting.

For the present I define *weissi* as having a dark brown to black strongly sclerotized male, and a similarly coloured female in which the postpetiole in dorsal view is quite narrow (1.20–1.40 × broader than long) and has a rounded or even hemispherical anterior margin. The worker of *weissi* has the alitrunk medium to dark reddish brown, the anterior margin of the pronotum in dorsal view sharply defined and angular where it meets the anterior declivity, and the sides of the alitrunk meeting the dorsum in a fairly well-defined angle.

M. emeryi and *beccarii*, on the other hand, have pale yellow feebly sclerotized males, and have females in which the postpetiole in dorsal view is quite broad (1.90–2.20 × broader than long) and lacking a rounded anterior margin, the margin instead being more or less straight or even slightly concave. The workers are yellow to light yellowish brown and have the sides of the alitrunk rounding bluntly into the dorsum when seen in dorsal view. Females of *emeryi* differ from those of *beccarii* as in the former the mesoscutum is broader than long in dorsal view; it is longer than broad in the latter. Workers of *emeryi* have the anterior margin of the pronotum sharply defined and angular where it meets the anterior declivity, whereas in *beccarii* there is no such sharp differentiation between dorsum and anterior declivity, instead the one surface rounds bluntly into the other.

The shape of the alitrunk in dorsal view shows subtle but perhaps significant differences between separate series of workers presently grouped as single species, but discovering whether these differences are meaningful, or even consistent, will have to await the amassing of considerably more samples than are presently available.

Synonymic list of Afrotropical *Melissotarsus* species

beccarii Emery
    titubans Delage-Darchen **syn. n.**
emeryi Forel
    emeryi var. *pilipes* Santschi **syn. n.**
    compressus Weber **syn. n.**
weissi Santschi
    major Santschi **syn. n.**

Key to species (workers)

1 With the alitrunk in dorsal view the anterior margin of the pronotum rounding evenly into the anterior declivity, the two not meeting in a sharp angle or edge. (Ethiopia, Tanzania, South Africa, Ivory Coast) . . . . **beccarii** (p. 336)

– With the alitrunk in dorsal view the anterior margin of the pronotum separated from the anterior declivity by a sharp angle or edge 2

2 Sides of alitrunk meeting dorsum in a fairly well-defined angle. Alitrunk colour medium to dark reddish brown. (Ghana, Congo, Zaire) . . . . **weissi** (p. 337)

– Sides of alitrunk rounding bluntly into the dorsum. Alitrunk colour yellow to light yellowish brown. (Ethiopia, Sudan, Kenya, Tanzania, Zaire, Central African Republic, South Africa, Ivory Coast, Ghana) . . . . **emeryi** (p. 337)

The three presently recognised species are basically so similar that to present a full description for each would be redundant so, for the purposes of identification, a description of the type-species *beccarii* is given and the other two are compared to it.

Melissotarsus beccarii Emery

Melissotarsus beccarii Emery, 1877: 379, fig. Syntype workers, ETHIOPIA: Keren (*Beccari*) (MCSN, Genoa; MHN, Geneva) [examined].

Melissotarsus titubans Delage-Darchen, 1972: 216, figs 1–10. Syntype workers, females, males, IVORY COAST: Lamto (*Delage-Darchen*) (probably in collection of Delage-Darchen). **Syn. n.**

WORKER. TL 2.3–3.3, HL 0.56–0.82, HW 0.56–0.80, CI 97–105, SL 0.24–0.34, SI 39–47, PW 0.34–0.55, AL 0.58–0.80 (15 measured).

With the head in full-face view the occipital margin concave, sometimes deeply so medially, and with the sides convex and weakly to distinctly convergent in front of the eyes. Mandibles with a long finger-like apical tooth, worn down to nothing in some specimens; the mandibles unsculptured. Eyes much longer than broad, strip-like in many, the maximum diameter 0.12–0.16, about 0.18–0.22 × HW. Median portion of clypeus raised above the level of the lateral portions, not extending back between the frontal lobes; the latter contiguous and separated only by an impressed line. Scapes very short, SI < 50. Alitrunk in dorsal view with anterior pronotal margin rounding into the declivity, the two surfaces not separated by a sharp edge or angle. Dorsum of alitrunk roughly rectangular longitudinally, somewhat narrower behind than in front but not strongly so, and with the dorsum rounding into the sides. In profile the promesonotal dorsum and anterior propodeum are more or less flat but the posterior part of the propodeum rounds very broadly and evenly into the declivity, without trace of armament. Fore coxae small, about half the size of the strongly swollen middle and hind coxae. Peduncle of petiole short and grading into the relatively high narrow node, the node with a short posterior free face, broadly attached to the postpetiole. In dorsal view the petiole node much broader than long. Postpetiole in dorsal view much broader than long, slightly broader than the petiole and very broadly attached to the first gastral tergite without a posterior constriction. Gaster only feebly sclerotized, crumpled in most mounted specimens. Dorsum of head with a silky superficial ground-sculpture upon which scattered small pits are usually superimposed. The ground-sculpture may cover the whole head but frequently it fades out occipitally. Median portion of clypeus more densely and strongly sculptured than dorsum of head capsule. Dorsal alitrunk finely longitudinally costulate throughout, the costulae fading out where the propodeal dorsum rounds into the declivity. Dorsal surfaces of head, scapes, pronotum, mesonotum, pedicel segments and gastral tergites with scattered sparse long fine hairs. Propodeal dorsum usually with one or two shorter hairs but these are frequently missing. Dorsal (outer) surfaces of tibiae with sparse long hairs similar to those on alitrunk. Head and alitrunk dull yellowish brown to dark yellow, the gaster lighter, usually pale dull yellow.

The key character given to separate *beccarii* and *emeryi* workers is quite weak. In most individuals there is a reasonable visible difference between the two, with the anterior pronotal margin rounding bluntly into the declivity in *beccarii*, and with the anterior pronotal margin separated from the declivity by an angle or edge in *emeryi*. Having said that, however, it should be pointed out that the difference is not so well marked in some individuals, which in consequence are difficult to place. Both species have a pale yellow feebly sclerotized male. Females of both species have the postpetiole in dorsal view conspicuously broader than long but it seems that two species are present as in some the mesoscutum is longer than broad (*beccarii*) but in others broader than long (*emeryi*). It should be admitted that very few worker-associated females are known and further collections may annul this apparent difference. To sum up, for the present I recognise these two as separate on the strength of the differently shaped mesoscutum in females and the form of the anterior pronotal margin in workers, but harbour a suspicion that only a single real species may in fact be represented here.

M. beccarii differs from *weissi* fairly consistently in all castes. The workers of *weissi* are darker in colour than those of *beccarii* and have both the anterior pronotal margin and the sides of the alitrunk relatively strongly marginate. The male is dark brown to black and strongly sclerotized, and in the female the postpetiole is relatively narrow in dorsal view with an arched-convex anterior margin which is quite different in shape from the strongly transverse form seen in *beccarii*. Measurements of the postpetiolar widths of the various forms are given under the discussion of the genus.

MATERIAL EXAMINED

Ivory Coast: Lamto Field Station (*W. L. Brown*); nr Abidjan (*W. L. Brown*). **Ethiopia:** Keren (*Beccari*). **Tanzania:** Lulanguru (*G. D. H. Carpenter*). **South Africa:** Natal, Durban (*C. B. Cooper*); Durban (*H. B. Marley*).

Melissotarsus emeryi Forel

Melissotarsus emeryi Forel, 1907: 133. Syntype workers, ETHIOPIA: Colba, 1905 (*M. de Rothschild*) (MHN, Geneva) [examined].

Melissotarsus emeryi var. *pilipes* Santschi, 1914*a*: 71. Syntype workers, KENYA: Tavéta, 750 m, st. no. 65, iii.1912; and TANZANIA: Kilimanjaro, Bismarckhügel, 2740 m, st. no. 70, iii.1912 (*C. Alluaud & R. Jeannel*) (NM, Basle) [examined]. **Syn. n.**

Melissotarsus compressus Weber, 1952: 1, figs 28, 29. Holotype female, CENTRAL AFRICAN REPUBLIC: Ubangi-Shari, Haut Mbomu, lat. 5° 30′ N., long. 25° 15′ E., iii.1948, no. 2184 (*N. A. Weber*) (AMNH, New York) [examined]. **Syn. n.**

WORKER. TL 2.5–3.4, HL 0.66–0.88, HW 0.70–0.90, CI 100–105, SL 0.30–0.38, SI 39–43, PW 0.37–0.57, AL 0.62–0.88 (13 measured).

Answering to the description of *beccarii* but with the anterior pronotal margin in dorsal view separated from the anterior declivity by a well defined angle or edge.

As pointed out under *beccarii* a few individuals seem intermediate between those of *emeryi* and those of *beccarii*, and in consequence are difficult to place. My suspicions are that these two names may represent a single species but I feel unsure enough to avoid synonymizing them whilst the apparent difference between the females remains unresolved. So, until the taxonomic value of the shape of the mesoscutum in females can be assessed, the two must remain as separate species.

MATERIAL EXAMINED

Ethiopia: Colba (*Rothschild*). **Sudan:** Darfur, Jebel Murra (*M. Steele*). **Kenya:** Muguga (*K. Njukiine*); Tavéta (*Alluaud & Jeannel*). **Zaire:** Popokabaka (*E. S. Ross & R. E. Leech*). **Ghana:** Tafo (*C. A. Collingwood*). **South Africa:** Cape Prov., Clanwilliam (*Y. Ben-Dov*). **Central African Republic:** Haut Mbomu (*N. A. Weber*).

Melissotarsus weissi Santschi

(Figs 23, 24)

Melissotarsus weissi Santschi, 1910: 356, fig. 3. Holotype female, CONGO: Brazzaville (*A. Weiss*) (NM, Basle). [Only gaster and one forewing remaining on mount.]

Melissotarsus major Santschi, 1919: 85. Syntype workers, ZAIRE: Penghe, 13.ii., no. 125 (*Bequaert*) (NM, Basle; MRAC, Tervuren) [examined]. **Syn. n.**

WORKER. TL 2.3–3.0, HL 0.58–0.74, HW 0.60–0.78, CI 98–104, SL 0.27–0.34, SI 41–47, PW 0.36–0.50, AL 0.56–0.84 (14 measured).

Answering to the description of *beccarii* but darker in colour, the alitrunk medium to dark reddish brown; with the anterior pronotal margin meeting the anterior declivity in a well-defined angle or edge, and with the sides of the alitrunk meeting the dorsum in a fairly well-marked angle.

Lighter coloured workers may sometimes be difficult to separate from *emeryi*, but in general the sharper marginations of the sides of the alitrunk in *weissi* are fairly distinct. The sexual forms of *weissi* are both easily separated from those of *emeryi* as the male of the former is dark brown to black (pale yellow and feebly sclerotized in the latter), and the female of *weissi* has the postpetiole relatively narrow in dorsal view with an arched-convex anterior margin, as opposed to a very broad and distinctly transverse postpetiole in *emeryi*.

MATERIAL EXAMINED

Ghana: Tafo (*B. Bolton*). **Zaire:** Kamaiembi (*H. Schouteden*); Penghe (*Bequaert*).

MESSOR Forel

(Figs 25–32, 35–43)

Messor Forel, 1890*a*: lxviii [as subgenus of *Aphaenogaster* Mayr]. Type-species: *Formica barbara* L., 1767: 962, by subsequent designation of Bingham, 1903: 277.

Messor Forel; Bingham, 1903: 277. [Raised to genus.]

Cratomyrmex Emery, 1891: 572. Type-species: *Cratomyrmex regalis* Emery, 1891: 572, by monotypy. [Synonymy by Emery, 1922*a*: 357.]

Veromessor Forel, 1917: 235 [as subgenus of *Novomessor* Emery]. Type-species: *Aphaenogaster andrei* Mayr, 1886: 448, by subsequent designation of Emery, 1921: 67. **Syn. n.**

Veromessor Forel; Wheeler, 1922: 680. [Raised to genus.]

Lobognathus Enzmann, 1947: 152 [as subgenus of *Veromessor*]. [Erroneous entry for *Veromessor lobognathus* (Andrews); see Brown, 1949: 49.]

DIAGNOSIS OF WORKER. Granivorous myrmicine ants, mostly strongly polymorphic but a few monomorphic or only weakly polymorphic. Head massively constructed in larger workers. Mandibles large and powerful, multidentate in smaller workers (up to 15 teeth) but this number usually decreasing with increased body size until in largest workers only a few massive teeth or an edentate crushing edge remains. Sometimes also in small workers the teeth are worn down to an edentate margin. Palp formula predominantly 4,3 but in largest workers usually 5,3 (30 species dissected). Median portion of clypeus broad and shield-like, broadly inserted between the widely separated frontal lobes; both median and lateral portions of clypeus unmodified except for a central impression of the anterior margin in some species. Frontal lobes short but conspicuous, at least partially concealing the antennal insertions. Frontal carinae absent. Antennal scrobes absent. Antennae 12-segmented, either filiform and without an apical club (in which case the flagellar segments gradually increase in size apically), or with a feebly defined incipient club where the apical 3–4 segments are slightly enlarged. Eyes present, moderate to large in size, situated at or just behind the midlength of the sides in full-face view. Ventral surface of head with elongate ammochaete hairs which usually form a psammophore. This may be reduced and non-functional in some species but the hairs are still conspicuous and generally longer than those found elsewhere on the body; in a few species the psammophore is better developed in smaller than in larger workers. With the alitrunk in profile the promesonotum swollen and convex, frequently dome-like and sloping down steeply behind to the metanotal groove which is weakly to distinctly impressed. Propodeum rounded to strongly bispinose posteriorly and on a much lower level than the convex promesonotum. Promesonotal suture fused and inflexible but its track represented by a distinct arched impression across the dorsum. Mesonotum bounded by impressions on all sides, its boundary easily discernible except in the smallest workers of a few species. Metapleural lobes absent or at most represented by a pair of low broadly rounded ridges. Propodeal spiracle large and conspicuous, circular to subcircular and situated approximately at the midlength of the propodeum or sometimes slightly behind the midlength, but never shifted conspicuously back towards the declivity. Basal posterior portion of mesopleuron just above the middle coxa with a few hairs projecting downwards and backwards. (Whether these are guard-hairs indicating the exit site of a gland is not known, but the hairs remain even in species where other body pilosity is very reduced or absent.) Spurs on posterior tibiae varying from very feebly pectinate through partially barbate and minutely barbulate to simple. Alitrunk ventrally with a strong metasternal process which is usually large to very large (reduced but still conspicuous only in *rufotestaceus* (Foerster) and *vaucheri* Emery out of 45 species dissected). Petiole with a long anterior peduncle, the spiracle situated at about the midlength of the peduncle, well in front of the node. Petiole node in profile narrow and often bluntly triangular to conical in shape, but frequently a sloping differentiated dorsal surface is present where the anterodorsal angle is generally the highest point.

Messor is a moderately sized genus of granivorous ants occurring in grassland and savannah, and in arid to desert situations. The main base of the genus is in the Palaearctic region where about 70–80 species occupy a broad strip of territory reaching across the whole width of North Africa and the southern European countries, across the Near and Middle East and thence eastwards through the U.S.S.R. to China and Japan. Compared to this the faunas of other zoogeographical regions are relatively minor. The Afrotropical region has 12 species and Madagascar has 1; the Oriental region has 3–4 species and the Nearctic has 8, all distributed on the western side of the continent and formerly occupying a genus of their own, *Veromessor*, now synonymized. Species of *Messor* are absent from the Neotropical region, the Indo-Australian region and Australasia, nor do they occur on any of the Pacific island systems.

Recent studies of *Messor* include those of Arnoldi (1977) on the fauna of the U.S.S.R., and Collingwood (1978) on the species of the Iberian Peninsula. The only previous synthesis of sub-Saharan African species is that of Arnold (1920), for the then-recognized South African forms, but no key was given in that revue. Creighton (1950) has keyed the North American species formerly in *Veromessor*. Knowledge of the detailed biology of the species is sparse, but good basic work has been done on some African species by Lévieux & Diomande (1978), and Lévieux (1979).

The closest relatives of *Messor* are the genera *Aphaenogaster* and *Pheidole* Westwood. Members of the latter genus are easily separated from *Messor* as the palp formula is reduced to 2,2, its species are dimorphic, and the antennal funiculus ends in a strongly defined 3-segmented club. *Aphaenogaster*, which is absent from sub-Saharan Africa, is more difficult to differentiate as its species, apart from being uniformly monomorphic, are very close to *Messor* and share most of its diagnostic characters, including the filiform to feebly clavate funiculi and high palp formula (PF) count. Of 55 species of *Aphaenogaster* dissected 31 had PF 5,3, and 24 had PF 4,3. For some reason, although species with the higher PF apparently outnumber those with the lower count, the zoogeographical distribution of the latter is much wider than that of the former. *Aphaenogaster* species with PF 5,3 are found in the Nearctic, Palaearctic and Oriental regions; species with PF 4,3 are also found in these three regions and in the Neotropical, Malagasy, Indo-Australian and Australasian regions as well.

After a study of *Aphaenogaster* for genus-level characters, primarily a search for strong characters to separate it from *Messor*, it became apparent that Brown (1973) was correct in relegating the former subgenera of *Aphaenogaster* to the synonymy. These former subgenera (*Attomyrma* Emery, *Deromyrma* Forel, *Nystalomyrma* Wheeler and *Planimyrma* Viehmeyer) have no significance as they are founded upon minor, inconsistent or gradient character-states. Further, it is now clear that Brown (1974) was also correct in assigning *Novomessor* to the synonymy of *Aphaenogaster*. The only real character separating the two was the fore-wing venation, there being one closed cubital cell in the former and supposedly two in the latter. The same character was invoked to separate *Veromessor* from *Messor*, again the former having one, the latter two closed cubital cells. A survey of the venation of *Aphaenogaster* and *Messor* shows that in both genera the same finely graded series of changes in wing venation occurs (Figs 35–43), which obviates these supposed differences in number of closed cubital cells; it is instructive to consider both genera together.

The most complete, and therefore most primitive, venation pattern (Fig. 35, *M. galla*) shows two closed cubital cells and has $Rs + M$ dividing well in front of the level of cross-vein $m - cu$, so that $m - cu$ arises from M itself and there is a short free section of M between the point of division of $Rs + M$ into its constituent parts and the point where $m - cu$ meets M.

The free section of M then contracts (Fig. 36; *M. tropicorum*, *angularis*, *nigriceps* Santschi; *A. geei* Wheeler, *schurri* (Forel)) as the fusion of $Rs + M$ lengthens outwards along the wing until the condition shown in Fig. 37 is seen (*M. rugosus* (André); *A. schurri*) where there is no free portion of M between $Rs + M$ and the point of origin of $m - cu$, the veins Rs, M and $m - cu$ all appearing to arise from a point at the apex of $Rs + M$.

Next, the fusion of $Rs + M$ advances further out along the wing so that Rs and M now separate a short distance beyond the point of origin of $m - cu$, which now arises direct from $Rs + M$ (Fig. 38; *M. intermedius* Forel, *angularis*, *himalayanus* Forel, *aciculatus* (Smith), *structor* (Latreille), *regalis*; *A. rudis* Emery, *treatae* Forel). Following this the fusion of $Rs + M$ advances further out along the wing, drawing closer to cross-veins $2r$ and $r - m$, as shown in Figs 39, 40, this stage constituting what may be considered as the normal pheidoline venation (*M. barbarus* (L.), *capitatus* (Latreille), *structor*, *galla*, *denticornis*, *capensis*, *leubberti*, *muticus* (Nylander), *aegyptiacus* (Emery), *nigriceps* Santschi, *semirufus* (André), *instabilis* (Smith), *meridionalis* (André); *A. geei*, *rudis*, *lamellidens* Mayr, *famelica* (Smith), *fulva* Roger, *japonica* Forel, *pallida* (Nylander), *huachucana* Creighton, *splendida* (Roger), *megommatus* Smith, *subterranea* (Latreille), *occidentalis* Emery, *crocea* André, *gemella* (Roger), *senilis* Mayr).

As the fusion of $Rs + M$ progresses still further along the wing a critical point is reached at which cross-vein $r - m$ vanishes. This occurs whilst the advancing fusion is still some little distance away from $2r$. A male of *A. spinosa* Emery in BMNH shows the critical point as the specimen has $r - m$ present on the left wing but it has vanished from the right. The dissapearance of $r - m$ leaves the venation as in Fig. 41, which is present in a wide range of species (*M. pergandei* (Mayr), *lobognathus*, formerly of *Veromessor*; *A. albisetosus* Mayr, formerly of *Novomessor*; *A. dromedarius* (Emery), *longiceps* (Smith), *pythia* Forel, *phalangium* Emery, *beccarii* Emery, *araneoides* Emery, *sagei* Forel).

Eventually the stage seen in Fig. 42 is reached where *Rs* and *M* are fused to the point of intersection of $2r$ (*M. andrei* (Mayr); *A. cockerelli* André), and finally in *A. ensifera* Forel the fusion of $Rs + M$ has extended beyond the level of $2r$ so that this cross-vein now arises from $Rs + M$ (Fig. 43).

It should be pointed out that there is considerable variation present along this sequence within single species and that it is by no means rare to find specimens with different venation patterns on the left and right forewings, representing different stages in the sequence, and thus showing it to be a dynamic rather than a static system. Also, adventitious vein-stubs frequently arise at random from all the main veins, and from the cross-veins too on occasion.

Thus the loss of $r - m$ cross-vein, reducing the two cubital cells to only one, rather than being the concise taxonomic character it was thought to be in the past, can now be seen as just one step in a long gradual sequence of venation development in both *Aphaenogaster* and *Messor*, and of no significance in genus-level discrimination among these ants. To draw a line at any point in the sequence and claim that it is more significant than a line drawn at any other point is thus purely arbitrary, and as a direct consequence of the establishment of this sequence the synonymy of *Novomessor* with *Aphaenogaster* is confirmed and the name *Veromessor* falls into the synonymy of *Messor*, there being no other consistent character to separate them.

A side development in the history of *Novomessor*, following Brown's (1974) synonymy, was the suggestion of Hölldobler, Stanton & Engel (1976) that the name might be resurrected for two of its former members (*albisetosus* and *cockerelli*) because of the presence of an exocrine gastral glandular system which was absent from other *Aphaenogaster* species examined, and incidentally absent also from the third former *Novomessor* species (*ensifera*), which was to be retained in *Aphaenogaster* despite the fact that it is otherwise very close to the first two. The obvious inference was that the presence of such a gland system merited genus-level consideration. This is reasonable logic as far as it goes, though many would argue (myself included) that basing genera on such features is grossly over-weighting a relatively weak single character. The discussion would probably have rested there but Kugler (1978) published a paper indicating that such glands occur widely in the Myrmicinae in a range of genera, including a member of *Aphaenogaster* (*phalangium*) whose placement in that genus has never been doubted, but which is not closely related to any of the three mentioned above. This gives rise to three possibilities.

Firstly, that the presence of such glands is highly significant and that, following the model of *Aphaenogaster-Novomessor*, every species showing such structures must be assigned to a genus separate from the parent genus, irrespective of any basic similarities they may otherwise show. The idea is ludicrous of course, and obviously not at all what Hölldobler *et al.* intended; the plethora of pointless generic names thus produced would be incredible and no more sensible than selecting genera from groups of closely related species on grounds of, say, presence or absence of hairs on the first gastral tergite. Hölldobler *et al.* in their study found a gastral exocrine system in one species of *Ocymyrmex* Emery but not in two others; they did not suggest the creation of a separate genus here.

Secondly, we can reassign such forms with gastral exocrine glands (or indeed any other individual specialization) when it suits us to do so, and ignore it otherwise. Thus we can utilize such a character to prop up an otherwise poorly defined or undefinable genus which looks like falling irrevocably into the synonymy. This idea does not hold much merit as it again leads unerringly to the creation of swarms of peripheral genera, each with only one or two species, which cannot be adequately separated from their closest relatives remaining embedded in the central mass of species.

Finally, we can consider that the development of such gland systems in some species of a genus but not in others, whilst uniformly stable genus-level characters span the entire range of species, reflects a specialization in the lifeway of the ants involved and is significant at species or species-group level but not beyond that, providing always that other genus-level characters remain uniform throughout. This is decidedly the alternative which I favour as in the long run it will produce strong, well-defined genera, and realistic species-groups within those genera.

To conclude the observations on the genus-level synonymy of *Aphaenogaster*, it is now apparent that the monotypic genus *Brunella* Forel sinks as a synonym. This Malagasy species has had a chequered career since its original description as *Aphoenogaster* [sic] *belti* Forel, 1895; 248. (Syntype workers, MADGASCAR: Imerina, Moramanga (*M. Sikora*) (MHN, Geneva) [examined].) It was later shifted by Forel (1917) out of *Aphaenogaster* to form the type-species of his genus *Brunella*. Emery (1922*a*: 242) disagreed with this and synonymized *Brunella* under *Atopula* Emery, which for him was a catch-all genus to which a number of obscure species were relegated. During my study of the tetramoriine genera (Bolton, 1976) it transpired that the type-species of *Atopula* was in fact a *Tetramorium*, so that the name *Atopula* fell into synonymy and the remaining former occupants of *Atopula* were transferred to other genera. At that time I had not examined the type-series of *belti* and so referred the species back to Forel's temporarily resurrected *Brunella*. Now, having at last examined the types of *belti*, it turns out to be a fairly unexceptional *Aphaenogaster* which seems to belong to the Oriental *sagei*-group as it has a broad occipital margin, relatively short antennal scapes, a moderately well-developed antennal club and distinct propodeal spines.

A summary of the current genus-level synonymy of *Aphaenogaster* is given in the appendix, p. 364.

Of the two names synonymized with *Messor* above, *Cratomyrmex* was recognized as a synonym by Emery as long ago as 1922. The separation of the two was based on the presence of pectinate hind tibial spurs in the latter and their supposed absence in the former. This was quickly spotted as a feeble and variable character and the status of the genus challenged (Santschi, 1920). The form of the hind tibial spurs is in fact very variable in *Messor*, showing all stages from feebly pectinate, through barbate and minutely barbulate to simple. Even in the same series there is sometimes variation in spur form between different-sized workers.

Veromessor, which began its existence as a subgenus of *Novomessor*, was given generic status by Wheeler (1922) who separated it from *Messor* on the venation character discussed above and now known to be spurious. The discussion in Wheeler & Creighton (1934: 356–360) indicated that *Messor* and *Veromessor* were extremely closely related, but no means of separating them was given. Presumably only the venation character invoked previously by Wheeler could be found. The present investigation has shown the two to be synonymous for, leaving aside the venation, all characters of *Messor* are duplicated in *Veromessor*, except for the species *relictus* Wheeler & Mann. This last was originally described as a member of *Aphaenogaster* but was transferred to *Veromessor* by Wheeler & Creighton (1934), for no apparent reason. In my opinion it is an ordinary member of *Aphaenogaster*, fitting the diagnostic characters of that genus and having all the criteria required to separate it from *Messor* which are tabulated below; it is herewith returned to *Aphaenogaster*. Finally, the fossil species *sculpturatus* Carpenter, originally described in *Messor* (where it is a junior secondary homonym of *sculpturatus* Stitz), later included in *Veromessor* but suggested as a possible *Pogonomyrmex* species by Wheeler & Creighton, is impossible to place at present and requires further study. The living North American species now included in *Messor* are *andrei* (Mayr) **comb. n.**, *chamberlini* Wheeler, *julianus* (Pergande) **comb. n.**, *lariversi* (Smith) **comb. n.**, *lobognathus* Andrews, *pergandei* (Mayr) **comb. n.**, *smithi* (Cole) **comb. n.**, *stoddardi* (Emery) **comb. n.**

Aphaenogaster and *Messor* are very closely related and certainly derive from a single parent stock. The characters tabulated below will separate them even though a few species show exceptions to one or another of the characters.

Messor	*Aphaenogaster*
Mostly polymorphic species (a very few feebly polymorphic and monomorphic species known).	Entirely monomorphic.
Mostly with ammochaete hairs present (reduced in a few species).	Mostly without ammochaete hairs (present in a very few species).
Head massive and broad, in medium to large workers CI > 90 (range 95–125 in 64 species measured).	Head usually slender, CI 90 at maximum, generally much less (range 49–90 in 75 species measured).
Metasternal process large to very large, always very conspicuous (45 species dissected).	Metasternal process small to absent, approaching size seen in *Messor* only in *A. subterranea* (55 species dissected).
Outer margins of mandibles strongly curved towards midline, the mandibles massive and heavy.	Outer margins of mandibles not strongly curved towards midline, the mandibles triangular in shape and not massive.

Synonymic list of Afrotropical *Messor* species

- ***angularis*** Santschi **stat. n.**
- ***capensis*** (Mayr)
  - *pseudoaegyptiaca* Emery **syn. n.**
  - *barbarus* subsp. *capensis* var. *schencki* Forel (unavailable)
  - *braunsi* Forel **syn. n.**
  - *donisthorpei* Santschi **syn. n.**
- ***cephalotes*** (Emery)
  - *plinii* Santschi **syn. n.**
- ***collingwoodi*** **sp. n.**
- ***decipiens*** Santschi **stat. n.**
  - *barbarum* r. *capense* var. *decipiens* Forel (unavailable)
  - *barbarus* subsp. *capensis* var. *proba* Forel (unavailable)
  - *arcistriatus* Santschi **syn. n.**
- ***denticornis*** Forel
  - *denticornis* var. *parvidens* Forel **syn. n.**
  - *denticornis* var. *brunni* Forel **syn. n.**
- ***galla*** (Mayr)
  - *barbarum* subsp. *caduca* var. *galla* Emery (unavailable)
  - *barbarus* subsp. *semirufus* var. *rufa* Forel (unavailable)
  - *barbarus* st. *galla* var. *triempressa* Santschi (unavailable)
  - *barbarus* st. *latinodis* Santschi **syn. n.**
  - *barbarus* r. *semirufus* var. *rufula* Forel (unavailable)
  - *barbarus* subsp. *galla* var. *armata* Emery (unavailable)
  - *galla* st. *nobilis* Santschi **syn. n.**
  - *galla* var. *airensis* Bernard **syn. n.**
- ***incisus*** Stitz (nomen dubium)
- ***luebberti*** Forel **stat. n.**
- ***piceus*** Stitz
- ***regalis*** (Emery)
  - *regalis* var. *rubea* Santschi **syn. n.**
  - *sculpturatus* Stitz **syn. n.**
- ***ruginodis*** Stitz **stat. n.** (nomen dubium)
- ***striatifrons*** Stitz **stat. n.**
- ***tropicorum*** Wheeler **stat. n.**
  - *denticornis* var. *laevifrons* Stitz **syn. n.**
  - *braunsi* var. *nigriventris* Stitz **syn. n.**

Key to species (medium to large workers)

Note. The nomina dubia *incisus* Stitz and *ruginodis* Stitz are omitted from the key.

1 Hairs absent from first gastral tergite or at most with a single sparse transverse row at the extreme apex of the sclerite 2

– Hairs present on first gastral tergite, more or less evenly distributed over the whole surface of the sclerite 5

2 Dorsum of propodeum with one or more pairs of standing hairs 3

– Dorsum of propodeum without standing hairs 4

3 Dorsum of head coarsely and densely reticulate-punctate everywhere, the mid-dorsal strip also rugulose. (Niger, Mali) . . . . ***collingwoodi*** (p. 346)

– Dorsum of head smooth everywhere except for the rugulose mid-dorsal strip; without coarse dense reticulate-punctate sculpture. (Throughout Sahelian zone and northern East Africa, also occurring coastally in West Africa) . . . . ***galla*** (p. 349)

4 Head sculptured everywhere with close-packed longitudinal rugulae between which is reticulate-punctate ground-sculpture. Eyes slightly smaller, 0.15–0.18 × HW in HW range of 2.00–3.12. (Tanzania, Zimbabwe, Angola, Botswana, South West Africa, South Africa) ***leubberti*** (p. 351)

– Head smooth except usually for a short central rugular area behind the frontal lobes. Eyes slightly larger, 0.18–0.21 × HW, in HW range of 2.00–2.76. (Kenya) . . ***angularis*** (p. 344)

5 Basal third or more of first gastral tergite strongly and conspicuously sculptured with rugulae, costulae, coarse reticulate-puncturation, or a combination of these. 6

– Basal third of first gastral tergite unsculptured except for hair pits and very faint superficial patterning. In some very large workers a few short basigastral costulae may develop but these are restricted to the area immediately behind the postpetiole 7

6 With the head in full-face view the sides with projecting hairs. Petiole and postpetiole coarsely closely and deeply rugose. (Nigeria, Benin Republic, Congo) . . . . . . ***regalis*** (p. 352)

– With the head in full-face view the sides without projecting hairs. Petiole and postpetiole finely sculptured with feeble rugulae, dense puncturation or a combination of both. (Ethiopia, Kenya, Tanzania) . . . . ***cephalotes*** (p. 346)

7 Posterior half of clypeus between frontal lobes with a distinct, strongly raised central step or welt. (Angola, South West Africa) . . . . ***tropicorum*** (p. 354)

– Posterior half of clypeus between frontal lobes without a raised central step or welt, usually more or less flat or even slightly concave 8

8 Eyes relatively large, the maximum eye diameter 0.21–0.25 × HW, in HW range of 2.50– > 4.00. (Botswana, South West Africa, South Africa) . . . . . ***denticornis*** (p. 349)

– Eyes smaller, the maximum eye diameter 0.14–0.19 × HW, in HW range of 2.50– > 4.00 . . 9

9 In HW range 2.80– > 4.00 the sides of the head conspicuously evenly convex in full-face view (Fig. 27). Propodeum in profile relatively long and low (Fig. 32). (South West Africa, South Africa) . . . . **striatifrons** (p. 353)

– In HW range 2.80– > 4.00 the sides of the head approximately straight in full-face view, the sides parallel or divergent anteriorly (Fig. 28). Propodeum in profile relatively short and high (Fig. 31) 10

10 Body pilosity very dark in colour, deep red-brown to blackish. (Botswana, South Africa) ***piceus*** (p. 352)

– Body pilosity pale, white or silvery to yellowish 11

11 Head red in major workers, contrasting in colour with the much darker alitrunk and gaster. (Zimbabwe, Botswana, Lesotho, South Africa) . . . . ***decipiens*** (p. 348)

– Head brown to black in major worker, about the same colour as the alitrunk and gaster. (South West Africa, Botswana, South Africa) . . . . ***capensis*** (p. 345)

Among strongly polymorphic species such as these, where there is an enormous worker size-range, the standard measurements which I have otherwise used consistently for the Myrmicinae become meaningless and cannot be utilized. A few standard ratios have, however, proved to be of value in some cases and these are included in the relevant descriptions. The keys and descriptions are based on medium to large workers as these show the best discriminating characters, the minor workers of closely related species being sometimes indistinguishable. Size ranges covered by the descriptions are given for each species in terms of HW range.

The presence or absence of propodeal teeth or spines, which appears to be a functional diagnostic character in other parts of the range of *Messor*, is not of much use in the Ethiopian region species for, although some always have the propodeum armed (*regularis*, *collingwoodi*) and some always have it unarmed and rounded (*angularis*, *luebberti*), the rest show a disconcerting variability in this character, sometimes differing even in individuals from the same nest sample.

The 12 recognizable species are distributed roughly as follows in the Afrotropical region.

Northern (Sahelian) species: *collingwoodi*, *galla*, *cephalotes* (in extreme east).
Western species: *regalis*, *galla* (coastally).
Eastern species: *cephalotes*, *angularis*, *leubberti* (in south), *galla* (in north).
Southern species: *denticornis*, *luebberti*, *striatifrons*, *tropicorum*, *piceus*, *decipiens*, *capensis*.

The species fall into two groups in terms of pilosity. The first group, characterized generally by reduced pilosity and virtual absence of hairs on the first gastral tergite, contains the species *angularis*, *collingwoodi*, *galla*, and *luebberti*. In the second group pilosity is generally dense and is evenly distributed over the first gastral tergite. Included here are the remaining eight species noted above. Of them *regalis* is very conspicuous and not obviously close to any of the others. Of the remainder the southern complex of *piceus*, *decipiens* and *capensis* may represent a single species, and *denticornis*, *striatifrons* and *tropicorum* are closely related.

Messor angularis Santschi **stat. n.**

(Figs 25, 26)

Messor barbarus st. *semirufus* var. *angularis* Santschi, 1914*a*: 75 [unavailable name]; Santschi, 1928: 202 [*galla* var. *angularis*, first available use of name]. Syntype workers, KENYA: Naivasha, 1900 m, st. no. 14, xii.1911 (*C. Alluaud & R. Jeannel*) (NM, Basle) [examined].

MEDIUM TO LARGE WORKER. HW 2.00– > 2.75.

Anterior clypeal margin flattened to weakly and quite broadly indented medially. With the head in full-face view the occipital margin indented medially, the indentation becoming more distinct with increased size. In HW range 2.00–2.80 the maximum diameter of the eye is 0.42–0.52, about 0.18–0.21 × HW, and the CI range is 104–113. Propodeum unarmed, rounded to right-angled where dorsum meets declivity and sometimes with a reinforcing ridge or flange following the curve, especially in largest workers. Dorsum of head with sculpture very reduced, sometimes without sculpture. Usually with a few very feeble low longitudinal rugulae between the frontal lobes which may extend for a short distance behind them. On each side of this median area, moving outwards towards the eyes and occipital corners, the head is unsculptured except for a very feeble superficial reticular pattern and a few scattered faint punctulae. Pronotum and mesonotum dorsally unsculptured to feebly densely punctulate, generally with some weak transverse rugulae immediately behind the cervical shield. Rarely these are absent but in some they extend further back on the pronotum than is usual. Propodeal dorsum transversely rugose, conspicuously more strongly sculptured than the pronotum or mesonotum. First gastral tergite unsculptured and smooth, usually with a faint superficial reticular pattern visible. Head dorsally with very reduced pilosity; apart from the strong mouthpart hairs and those around the frontal lobes the dorsum with only 2–3 pairs, spanning the midline of the head. With the head in full-face view the sides both in front of and behind the eyes, the occipital corners and the occipital margin without projecting hairs except mid-occipitally where the posteriormost dorsal pair may project on each side of the occipital impression. Psammophore strong, the J-shaped hairs very long and conspicuous. Pronotum dorsally with 0–3 pairs of hairs, when present situated posteriorly, close to the promesonotal junction. Mesonotum with 0–5 pairs of hairs. Some of this variation may be due to abrasion, the mesonotal hairs in particular seem easily lost. Propodeum always hairless dorsally. Petiole with 0–1, postpetiole with 0–2 pairs of hairs respectively. First gastral tergite hairless or at most with a sparse transverse row at the extreme apex of the sclerite. Colour variable, usually with reddish head and alitrunk and black gaster, but the alitrunk often with some black, the amount of which varies from sample to sample. In extreme cases the entire body black but even here the head with a reddish tint showing through.

One of the four sub-Saharan African species which lacks hairs on most or all of the first gastral tergite, *angularis* is at present known only from Kenya. The most closely related species is the extremely widespread *galla* which also occurs in Kenya. The two are separated as follows.

angularis	*galla*
Propodeal dorsum without hairs.	Propodeal dorsum with one or more pairs of hairs.
Occipital margin on each side of the median impression without projecting hairs.	Occipital margin on each side of the median impression with one or more pairs of projecting hairs.
Ventral surface of hind femora without freely projecting hairs or at most with 1–2 close to the trochanter.	Ventral surface of hind femora with numerous freely projecting hairs which usually occur over the length of the shaft but which are often densest proximally.

Ventral surface of postpetiole in profile without an anterior prominence or at most with a feeble angle, the surface immediately behind this smoothly concave.	Ventral surface of postpetiole in profile with a sharp dentiform or angular prominence anteriorly, the surface immediately behind this irregular, not smoothly concave.
Median strip of head dorsally unsculptured or at most with very feeble rugulae anteriorly.	Median strip of head dorsally usually conspicuously rugulose, only very rarely reduced.

MATERIAL EXAMINED

Kenya: Tana Riv. (*J. L. Clark*); Olikoriti (*M. G. Lepage*); Kajiado (*J. Darlington*); Bissel (*J. Darlington*); Kajiado (*G. Nyamasyo*); Kajiado (*W. Sands*); Isiolo (*E. S. Ross & R. E. Leech*); Naivasha (*Alluaud & Jeannel*).

Messor capensis (Mayr)

(Fig. 31)

Atta capensis Mayr, 1862: 743. LECTOTYPE worker, SOUTH AFRICA: Cape of Good Hope, Novara Expd. " D ". (NM, Vienna), here designated [examined].

Aphaenogaster pseudoaegyptiaca Emery, 1884: 384. Syntype workers, SOUTH AFRICA: Cape of Good Hope (MCSN, Genoa) [examined]. **Syn. n.**

Messor barbarus subsp. *capensis* var. *schencki* Forel, 1910*a*: 15. Holotype worker, SOUTH WEST AFRICA: Bethanien (*Schenck*) (not found in MHN, Geneva, presumed lost). [Unavailable name.]

Messor braunsi Forel, 1913*b*: 138. Syntype workers, SOUTH AFRICA: Cape Prov., Willowmore (*H. Brauns*) (MHN, Geneva) [examined]. **Syn. n.**

Messor donisthorpei Santschi, 1937: 51. Syntype workers, females, SOUTH WEST AFRICA: West of Maltahohe, 1500 m, 12.xii.1934 (*K. Jordan*) (BMNH; MCZ, Cambridge; USNM, Washington) [examined]. **Syn. n.**

MEDIUM TO LARGE WORKER, HW 2.35– > 3.40.

Anterior clypeal margin varying from shallowly convex to transverse, only very rarely with the faintest vestige of a median indentation. With the head in fullface view the sides more or less straight and approximately parallel, never evenly convex nor obviously diverging anteriorly. Occipital margin broadly and shallowly concave to indented medially. In HW range 2.35–3.44 the maximum diameter of the eye is 0.40–0.58, about 0.15–0.19 × HW, and the CI range is 103–119. Propodeum in profile with the dorsum rounding narrowly into the declivity in most cases; in some more broadly rounded and in a few right-angled, but only rarely with dentiform prominences and here usually only in the largest workers. Usual sculpture of entire dorsum of head of fine, densely packed parallel longitudinal rugulae, most commonly with fine punctulation between them. Variation in the sculpture consists of a reduction, in density or intensity, or one or both of these components. Sometimes the rugulae are more widely spaced and fainter than is usual, in which case the punctulate ground-sculpture is much more obvious and may appear as the dominant component in places. On the other hand the punctulate sculpture may fade out, leaving the rugulae sharply defined; the rugulae may then also become less intense and leave the head only feebly sculptured. Dorsal alitrunk usually rugose or rugulose everywhere but, as on the head, this sculpture may be reduced until it is very faint or even absent. When distinctly present the direction of sculpture on the pronotum shows variation. Commonly it is longitudinal but forms with the sculpture diagonal, transverse, irregular or varying on different parts of the surface are fairly frequent. First gastral tergite unsculptured or at most with a very faint superficial patterning. All dorsal surfaces of head and body with numerous conspicuous standing hairs. Colour black to dark reddish brown, the head and alitrunk always the same colour, the gaster sometimes darker.

The taxa *capensis*, *decipiens* and *piceus*, treated here as separate species, may in fact represent only a single variable species. The differences invoked to distinguish the three are minor (see key) and may eventually prove to be gradient.

Among the species in which the first gastral tergite is uniformly hairy the three taxa mentioned above are characterized together by their relatively small eyes, lack of strong gastral sculpture, relatively straight-sided head and short propodeum, and lack of a median prominence on the posterior half of the clypeus.

MATERIAL EXAMINED

Botswana: Kuke Pan (*Vernay-Lang*); Gomodimo Pan (*Vernay-Lang*); Gomodimo (*G. U. Son*). **South Africa:** Cape Prov., Willowmore (*G. Arnold*); Willowmore (*H. Brauns*); Grahamstown (*W. L. Brown*); Grahamstown (*F. Jacot-Guillarmod*); Cape Town (*E. Simon*); Cape Town (*J. C. Bridwell*); Cape Town (*R. E. Turner*); Addo (*M. Samways*); Balfour (*E. S. Ross & R. E. Leech*); Fish River Valley (*G. Arnold*); Fort Beaufort (*J. W. G.*); Oudtshorn (*B. Brunhuber*); Port Elizabeth (*B. Brunhuber*). **South West Africa:** W. of Malahohe (*K. Jordan*).

Messor cephalotes (Emery)

Stenamma (*Messor*) *barbarum* subsp. *cephalotes* Emery, 1895*a*: 179. Syntype workers, ETHIOPIA: Arussi Galla, Ganale Gudda, 3.v.1893 (*V. Bottego*) (MCSN, Genoa; MHN, Geneva) [examined].

Messor cephalotes (Emery) Emery, 1908: 443. [Raised to species.]

Messor plinii Santschi, 1912: 165. Syntype workers, KENYA: Nakuru, 1904 (*C. Alluaud*) (NM, Basle) [examined]. **Syn. n.**

MEDIUM TO LARGE WORKER, HW 3.20– > 5.00.

Median portion of clypeus with anterior margin broadly but shallowly indented-concave. With the head in full-face view the occipital margin more or less transverse, very shallowly impressed medially to virtually straight, only very rarely evenly shallowly convex. Head broad and massive, very strongly transversely convex between the eyes, CI 109–123 in HW range 3.28–5.52. Eyes fairly small, their maximum diameter 0.54–0.72, about 0.13–0.17 × HW within the above-stated HW range; the relatively smaller eyes occurring in larger individuals. Psammophore generally more strongly developed in smaller than in larger workers, the characteristic hooked or J-shaped hairs sparse or absent in very large workers. Propodeal dorsum varying from rounding bluntly and evenly into the declivity to meeting the declivity in a sharp right-angle. In either case a low reinforcing lip or flange may be present which follows the curve, but prominent blunt teeth or lamellae are only very rarely known to develop. Dorsum of head blanketed everywhere with extremely fine, very densely and tightly packed, parallel longitudinal costulae; the head with a silky appearance under low magnification. The direction of the costulae is variable but usually they run straight back from clypeus to occiput centrally on the dorsum, and tend to diverge towards the occipital corners away from this central strip. In very large workers there is a tendency for the direction of the sculpture to be less regular, and even loops or whorls may occur. Dorsal alitrunk densely rugulose everywhere, the sculpture usually transverse but sometimes irregular on the propodeum. Sculpture on propodeal dorsum generally coarser and more widely spaced than on pronotum, and always coarser on pronotum than on dorsum of head. Petiole and postpetiole finely and densely sculptured with feeble rugulae, dense puncturation, or a combination of both. Base of first gastral tergite extensively sculptured with exceedingly fine close-packed scratch-like costulae, or sometimes with dense granular puncturation, or with a combination of both. The extent of this sculpture is variable but always at least the basal third of the first tergite is covered. Pilosity quite dense, all dorsal surfaces of head and body with standing hairs. With the head in full-face view the sides in front of and behind the eyes, and the curved side portions of the occipital corners, without projecting hairs; the occipital margin itself usually with conspicuous projecting hairs. Colour red to reddish dark brown, often with the gaster somewhat darker than the head and alitrunk.

A very distinctive East African species, *cephalotes* is one of the only two known African forms in which the gaster is strongly sculptured. The other, *regalis*, has much coarser sculpture, as noted in the key, and also differs by having the propodeum always bidentate or bispinose, a feature only very rarely developed in *cephalotes*. Beside this the anterior clypeal margin, always concave in *cephalotes*, is shallowly convex and irregular in *regalis*, and the sides of the head, hairless in *cephalotes*, have distinct standing hairs in *regalis*, at least behind the eyes.

MATERIAL EXAMINED

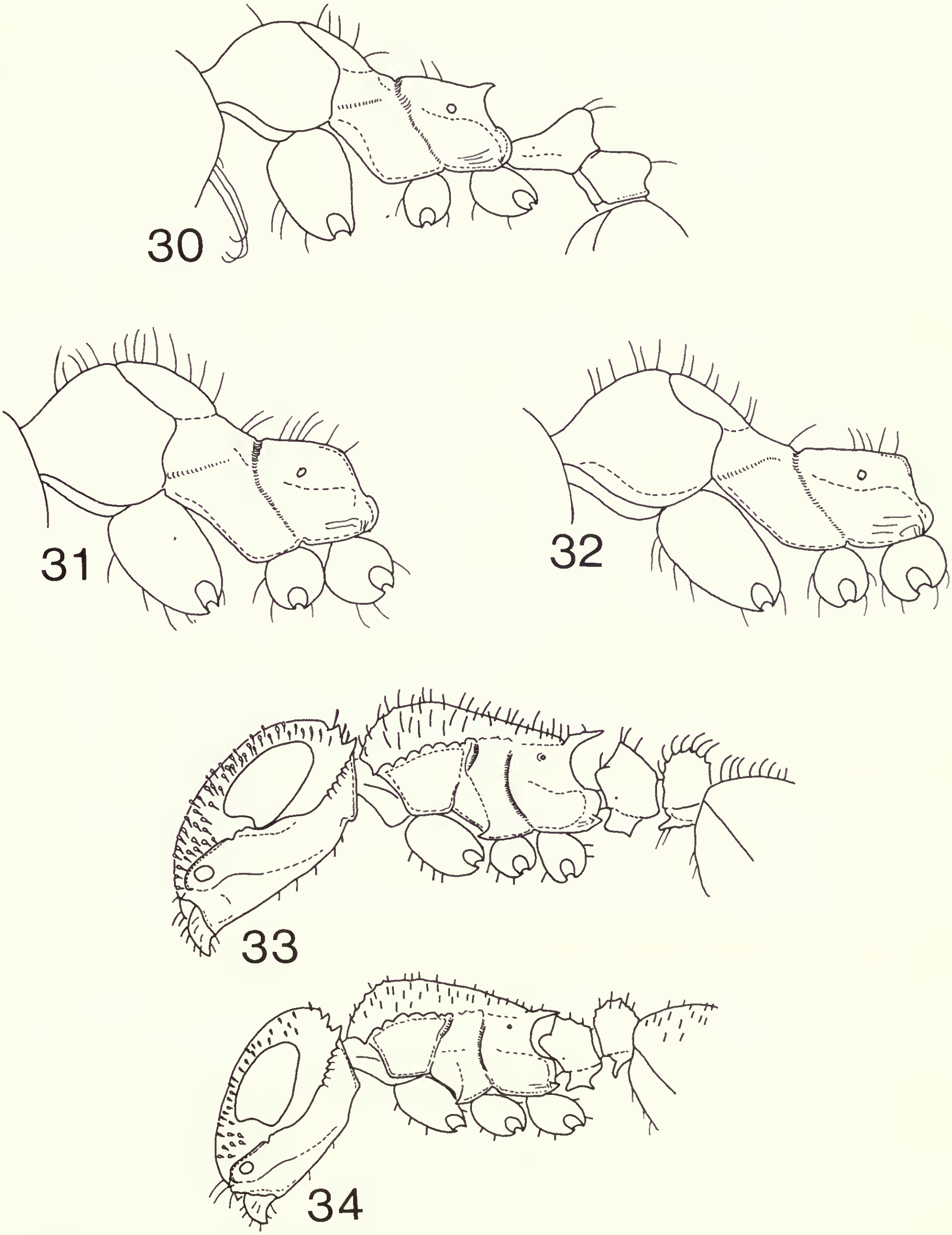
Ethiopia: Ganale Gudda (*V. Bottego*). **Kenya:** Nakuru, (*E. Pinhey*); Nakuru (*T. J. Anderson*); Nakuru (*C. Alluaud*); Lake Ngunga (*Allen & Brooks*); Kericho (*F. W. Dry*); Athi Riv. (*C. S. Betton*); Olikoriti (*M. G. Lepage*); Kajiado (*J. Darlington*); Kajiado (*G. Nyamasyo*). **Tanzania:** Dodoma (*W. M. Mann*); Umbulu (*W. M. Mann*); Arusha (*C. F. D.*).

Messor collingwoodi sp. n.

(Fig. 30)

HOLOTYPE WORKER, HW 2.56.

Anterior clypeal margin broadly but shallowly indented medially. With the head in full-face view the sides more or less straight, slightly convergent anteriorly and rounding broadly and evenly into the occipital margin behind. Occipital margin sharply indented medially. Maximum diameter of eye 0.52, about 0.20 × HW, and the CI 107. Propodeum armed with a pair of short but well-developed triangular spines which are somewhat downcurved along their length. Dorsum of head sculptured everywhere. Mid-dorsal strip of head longitudinally rugulose to level of posterior margins of eyes; behind this the rugulae rapidly weakening. Everywhere dorsum of head finely and very densely reticulate-punctate, with superimposed very feeble rugulae away from the more strongly sculptured median strip. Pronotum and mesonotum dorsally



Figs 30–34 30–32, *Messor* workers. Alitrunk of (30) *collingwoodi*, (31) *capensis*, (32) *striatifrons*. 33, 34, *Cataulacus* workers. Profile of (33) *centrurus*, (34) *moloch*.

transversely rugulose, the propodeum more strongly transversely rugose. Sides of pronotum less strongly rugulose than the pleurae. First gastral tergite unsculptured except for the usual fine superficial reticular patterning. Dorsum of head sparsely hairy. Discounting the strong pilosity on the mouthparts and around the frontal lobes the dorsum with only a few pairs of hairs spanning the mid-dorsal strip. With the head in full-face view the sides both in front of and behind the eyes lacking projecting hairs. Projecting hairs also absent from occipital corners but a single hair projecting from the occipital margin on each side of the median indentation. Psammophore strongly developed, the J-shaped hairs conspicuous. Dorsal alitrunk without hairs on pronotum, with 4 pairs on mesonotum and one pair on the propodeum. Petiole with one pair, postpetiole and first gastral tergite hairless. Colour uniform very dark blackish brown.

Medium to large paratype workers, HW 2.16–2.72. As holotype but in some individuals the mid-dorsal rugulae of the head more sharply defined. Variation in pilosity throughout the type-series shows the dorsal head with 2–5 pairs, pronotum with 0–1 pair, occipital margin with 0–2 pairs, mesonotum with 4–6 pairs, propodeum with 1–3 pairs, petiole with 0–3 pairs, postpetiole with 0–3 pairs of hairs. First gastral tergite consistently hairless. Eyes fairly large, within the HW range given above the maximum eye diameter is 0.46–0.58, about 0.20–0.22 × HW. CI range is 103–110.

Holotype worker, **Niger:** Azanyares, iii.1979 (*J. Newby*) (BMNH).

Paratypes. 12 workers with same data as holotype (BMNH; MCZ, Cambridge; NM, Basle; MHN, Geneva).

Non-paratypic material examined. **Mali:** Tessalit (*P. Room*).

Among the species with hairless or near hairless first gastral tergite *collingwoodi* is distinguished by having propodeal hairs present, having an extensively sculptured head, and having persistent propodeal spines. *M. luebberti*, which also has the head sculptured everywhere, is reddish in colour and lacks propodeal hairs and spines. Also, the rugular cephalic sculpture is more extensively developed than in *collingwoodi*. *M. angularis* also lacks propodeal hairs and spines and has the head weakly or not sculptured. *M. galla*, which frequently develops propodeal lobes or teeth and which also has propodeal hairs present, lacks the characteristic cephalic sculpture of *collingwoodi*.

The closest relatives of *collingwoodi* are, however, not to be found among the other sub-Saharan African species but among the members of the *aegyptiacus*-group, of which *collingwoodi* seems to be the only Afrotropical species.

Messor decipiens Santschi **stat. n.**

(Fig. 28)

Stenamma (*Messor*) *barbarum* r. *capense* var. *decipiens* Forel, 1905: 177 [unavailable name]; Santschi, 1917: 94 [*Messor capense* st. *decipiens*, first available use of name]. Syntype workers, females, SOUTH AFRICA: Natal (*Wroughton*) (MHN, Geneva) [examined].

Messor barbarus subsp. *capensis* var. *proba* Forel, 1911*a*: 266. Holotype worker, SOUTH AFRICA: Orange Free State, Bothaville (*H. Brauns*) (MHN, Geneva) [examined]. [Unavailable name.]

Messor arcistriatus Santschi, 1928: 202. Holotype worker, SOUTH AFRICA: Natal (*Wroughton*) (NM, Basle) [examined]. **Syn. n.**

Medium to large worker, HW 2.64– > 4.20.

Answering to the description of *capensis* in most particulars. In the HW range quoted above the maximum diameter of the eye is 0.44–0.66, about 0.14–0.18 × HW, and the CI range is 107–121, the largest workers known for *decipiens* thus being somewhat larger and broader headed than those known for *capensis*. Propodeum in profile with the dorsum usually meeting the declivity in a right-angle, which may project into a broad but quite short lobe or tooth of variable shape and size; rarely the propodeum merely narrowly rounded. In contrast the propodeum of *capensis* is generally rounded, only seldom with dentiform prominences. Sculpture of head basically the same as in *capensis* but here the rugae tending to be more sharply developed and more widely separated, although there is some variation. Spaces between the rugae usually smooth, frequently glossy, much less commonly with traces of punctulate ground-sculpture. Head usually obviously red, contrasting in colour with the alitrunk and gaster which are darker. In smaller workers this distinction in colour is not nearly so obvious and at the lower limit of the size range considered here (and smaller) the ant may be unicoloured.

Very closely related to *capensis* and *piceus*, *decipiens* is separated from the former only on the weak characters mentioned above. It is even closer to the latter, being distinguished only by the colour of the hairs as noted in the key, and the fact that *piceus* does not have the head distinctly different in colour from the alitrunk in large workers. It seems very probable that more extensive collecting of this complex will reveal that these forms represent but a single species.

MATERIAL EXAMINED

Zimbabwe: Bulawayo (*G. Arnold*). **Botswana:** Ghazi (*J. Maurice*). **Lesotho:** Mafeteng (*R. Crawshay*). **South Africa:** Natal, Weenen (*G. Arnold*); Natal (*Wroughton*); Durban (*G. Arnold*); Drakensberg, Van Reenen (*R. E. Turner*); Mkuzi Reserve (*C. P. Peeters*); no loc. (ex coll. F. Smith); Transvaal, Brakfontein (*Lingnau*); Vryburg (*G. Arnold*); Shiluvane (*Junod*); Orange Free State, Bothaville (*H. Brauns*).

Messor denticornis Forel

(Fig. 29)

Messor denticornis Forel, 1910*a*: 14. Syntype workers, female, male, SOUTH WEST AFRICA: Lüderitzbucht, 1903 (*L. Schultze*) MHN, Geneva; BMNH) [examined].

Messor denticornis var. *parvidens* Forel, 1910*a*: 15. Syntype workers, SOUTH WEST AFRICA: Kubub (*L. Schultze*) (MHN, Geneva) [examined]. **Syn. n.**

Messor denticornis var. *brunni* Forel, 1910*b*: 444. Syntype workers, SOUTH WEST AFRICA: no loc. (*Brunn*); and SOUTH AFRICA: Cape Prov., Steckstown (*Wartmann*) (MHN, Geneva) [examined]. **Syn. n.**

MEDIUM TO LARGE WORKER, HW 2.48– > 3.10.

Anterior clypeal margin usually evenly convex medially, only rarely with the faintest trace of a central indentation. With the head in full-face view the sides more or less straight and diverging anteriorly, but sometimes the sides more nearly parallel. Occipital margin broadly but shallowly concave, this feature fading out in smaller workers where the margin is approximately transverse. In HW range 2.48–3.16 the maximum diameter of the eye is 0.56–0.70, about 0.21–0.25 × HW, and the CI range is 100–106. Propodeum in profile relatively long and low, resembling that of *striatifrons* (Fig. 32). Propodeal armament very variable, the junction of dorsum and declivity being rounded, acutely angled or distinctly bidentate. These variants are commonly seen in the same series and are in fact shown by the type-series of *denticornis* itself. Basic sculpture of the head finely densely packed parallel longitudinal rugulae with punctulate ground-sculpture between them. Frequently the sculpture much reduced, either by suppression of the ground-sculpture so that the rugulae stand out from a smooth surface or by reduction of the rugulae in number and intensity so that the head is mostly or wholly punctulate. In smaller individuals the surface may be almost smooth. Dorsal alitrunk rugulose to rugose, the sculpture sometimes partially or totally effaced from the pronotum. First gastral tergite smooth and shining or at most with faint superficial patterning. All dorsal surfaces of head and body with numerous standing hairs. Colour mid-brown to black, sometimes with the gaster darker than the head and alitrunk.

A distinctive species amongst those with uniformly distributed pilosity on the first gastral tergite, *denticornis* is immediately isolated by its relatively large eyes. Only a few workers of *tropicorum* approach even the lower end of its eye size range but in the latter species the clypeus has a conspicuous posteromedian tumulus or welt and the propodeum is shorter and higher in profile than is the case in *denticornis*.

MATERIAL EXAMINED

Botswana: Ghanzi (*E. S. Ross & A. R. Stephen*). **South West Africa:** Okaukuejo (*E. S. Ross & R. E. Leech*); Spitzekopfe (*E. S. Ross & K. Lorenzen*); Ababis (*R. W. Tucker*); Berseba (*L. O. Sordahl*); Lüderitzbucht (*L. Schultze*); Kubub (*L. Schultze*). **South Africa:** Cape Prov., Oudtshorn (*B. Brunhuber*); Strydenburg (*M. Patterson*); Steckstown (*Wartmann*).

Messor galla (Mayr)

Stenamma (*Messor*) *barbarum* subsp. *caduca* var. *galla* Emery, 1895*a*: 179 [unavailable name]; Mayr, 1904: 5 [*Stenamma* (*Messor*) *barbarum* var. *galla*, first available use of name]; Santschi, 1928: 201 [*galla* raised to species]. Holotype worker, ETHIOPIA: Alto Duau, Boran Galla, v. 1893 (*V. Bottego*) (MCSN, Genoa) [examined].

Messor barbarus subsp. *semirufus* var. *rufa* Forel, 1910*c*: 250. Syntype workers, ETHIOPIA: Nefassit (*K. Escherich*) (MHN, Geneva) [examined]. [Unavailable name.]

Messor barbarus st. *galla* var. *triempressa* Santschi, 1917: 92. Syntype workers, CHAD: Baguirmi, Techeckna; ETHIOPIA: no loc.; SENEGAL: Casamance (*Clavaux*). (NM, Basle) [examined]. [Unavailable name.]

Messor barbarus st. *latinoda* Santschi, 1917: 93, fig. 2. Syntype workers, 'EAST AFRICA': no loc. (*Reichensperger*) (NM, Basle) [examined]. **Syn. n.**

Messor barbarus r. *semirufus* var. *rufula* Forel, 1918: 156. [Unnecessary replacement name for *rufa* Forel, 1910*c*: 250, above.] [Unavailable name.]

Messor barbarus subsp. *galla* var. *armata* Emery, 1922*b*: 98. Syntype workers, GHANA: no loc. (MCSN, Genoa) [examined]. [Unavailable name.]

Messor galla st. *nobilis* Santschi, 1928: 201. Syntype workers, female, ETHIOPIA: Bisa Tint, 1200 m (*Reichensperger*) (NM, Basle) [examined]. **Syn. n.**

Messor galla var. *airensis* Bernard, 1950: 286, Syntype workers, NIGER: Air Dist., Dabaga, 600 m; Mt Baguezans, 1500 m; Agadez, 525 m (*Chopard & Villiers*). [Not found in MNHN, Paris, presumed lost.] **Syn. n.**

MEDIUM TO LARGE WORKER, HW 2.40– > 3.70.

Median portion of clypeus with anterior margin broadly but shallowly concave to more or less entire. With the head in full-face view the sides very shallowly convex to roughly straight, usually slightly convergent in front of the eyes. Occipital margin broadly indented medially. In HW range 2.40–3.76 the maximum diameter of the eye 0.44–0.68, about 0.17–0.20 × HW, and the CI range 102–114. Propodeum showing great variation; frequently with the dorsum rounding into the declivity but sometimes with a pair of broad teeth or lamellae. Between these two extremes is a range of intermediates including forms with a narrow to broad rim or flange following the curve of the surface, forms with a small to large salient angle and forms with the angle or flange projecting to various degrees. Dorsum of head smooth and shining, away from the median strip sculptured only with very widely scattered small pits or a faint superficial patterning. Median strip of head behind clypeus with longitudinal rugular sculpture which usually extends back at least as far as the level of the posterior margins of the eyes, and often distinctly further back than this; only very rarely is the rugular strip shorter. Intensity of rugulae on the median strip very variable and the width of the strip not usually exceeding the width across the frontal lobes and often narrower, only rarely slightly wider. Pronotum dorsally with weak transverse rugulae which may sometimes be very feeble or even partially effaced. Mesonotum varying from almost smooth to faintly rugulose. Propodeal dorsum generally sharply transversely rugose but in some samples the rugae diagonal, irregular or interrupted. First gastral tergite unsculptured but often showing a faint superficial patterning. With the head in full-face view the sides without projecting hairs, the occipital margin with 0–4 hairs on each side of the median impression. Generally hairs are present occipitally, specimens with zero count are very few and may be the result of abrasion. Dorsum of head sparsely hairy, the psammophore conspicuous ventrally. Parts of dorsal alitrunk with pilosity as follows; pronotum with 0–4 pairs, mesonotum with 4–10 pairs, metanotal groove with 1–2 pairs at least in large workers, propodeum with 1–5 pairs. Petiole with 1–3, postpetiole with 3–6 pairs of hairs. First gastral tergite without hairs or with a sparse transverse row at the extreme apex of the sclerite. Ventral surfaces of hind femora usually with hairs all along the shaft but in some they are denser proximally than distally. Colour reddish brown to blackish brown, usually with the gaster darker than the head and alitrunk. In some samples the head slightly more reddish than the alitrunk.

Without doubt the commonest, most successful and most widely distributed *Messor* species in the northern half of sub-Saharan Africa, *galla* ranges throughout the Sahelian zone across the entire width of the continent. On the eastern side it is found as far south as Kenya, and in the west it occurs coastally as well as in the drier northern parts of the West African states. Of the four species in the region which lack dense gastral pilosity *galla* is separated from *collingwoodi* and *luebberti* by the extensive cephalic sculpturing of the last two. The separation of *galla* from its closest African relative, *angularis* of Kenya, is tabulated under that name. Some aspects of the biology of *galla* have been investigated by Lévieux & Diomande (1978) and Lévieux (1979).

MATERIAL EXAMINED

Ethiopia: Addis Ababa, Entoto Hills (*K. Guichard*); Addis Ababa (*V. O. De Massi*); Boran Galla (*V. Bottego*); Lake Zwai, Sucsuci (*J. O. Cooper*); Wachacha Ravine (*H. Scott*); Bisa Tint (*Reichensperger*); Mt Monagasha (*Cloudsley-Thompson*); Gondar (*Cloudsley-Thompson*); Tisisat Falls (*Cloudsley-Thompson*); Holetta; Dessie (*E. S. Ross*); Nefassit (*K. Escherich*); Barentu (*Müller*); Tessenei (*Müller*); Amba Derho (*Müller*); Om Agar (*Müller*); Ghinda (*K. Escherich*); no loc. (*G. McCreagh*). **Somali Republic:** Alabla Balleh (*P. E. Glover*). **Kenya:** Nakuru (*N. A. Weber*); Marsubit (Rift Valley Expd.); Tsavo East (*J. Darlington*); Maralal (*M. E. Irwin & E. S. Ross*). **Sudan:** Kadugli (*C. Sweeny*); Khartoum (*N. A. Weber*); Khartoum (*R. Cottom*); Khartoum (*H. H. King*); Kulme (*H. Lynes*); Lake Kellek (*C. Sweeny*); Dilling-El Obeid Rd. (*C.

Sweeny); Sennar (*B. Hocking*); Imatong Mts (*N. A. Weber*); Equatoria (*N. A. Weber*). **Niger:** Niamey (*P. Room*); Niamey (*J. Lévieux*); Ayorou (*P. Room*); Assode (*J. Lévieux*). **Mali:** Gao (*B. Malkin*); Anefis (*P. Room*). **Upper Volta:** Ougadougou (*P. Room*); Banfora (*Betbeder*). **Senegal:** Dakar (*W. L. Brown*); Dakar (*N. L. H. Krauss*); Casamance (*Clavaux*). **Ivory Coast:** Korhogo (*R. Lucius*); Ferkessedougou (*J. Lévieux*). **Ghana:** Lawra (*W. Cook*); Bolgatanga (*P. Room*); Tamale (*Anipare*); Tumu (*P. Room*); Navrongo (*C. A. Collingwood*); Dawhwenya (*D. Leston*); Dawhwenya (*C. A. Collingwood*); Nyankpala; Prampram (*W. Belfield*); Achimota (*W. Belfield*); Nungua (*W. Belfield*); Accra (*C. A. Buckman*). **Nigeria:** Kalkala (*F. D. Golding*); Illela (*Lelean*); Katsina (*J. T. Medler*); Zaria (*A. S. Ahman*); Maiduguri (*E. R. Ross & K. Lorenzen*).

Messor incisus Stitz nomen dubium

Messor incisus Stitz, 1923: 149. Holotype female, SOUTH WEST AFRICA: Okosongomingo Farm, vii–viii.1912 (*H. Thomsen*) [not found in MNHU, Berlin, presumed lost].

Described from a single female which has since been lost, the identity of *incisus* cannot be ascertained accurately at present. In his original description of *incisus* Stitz compares it to the female of *denticornis*. So few females of *denticornis* are known that it is possible for *incisus* to fall within the range of variation of that species. On the other hand *incisus* may be the female of *striatifrons* or indeed be a separate species. Considerably more samples of *Messor* females will be necessary before any attempt at placing *incisus* can be made.

Messor luebberti Forel **stat. n.**

Messor barbarus subsp. *lübberti* Forel, 1910*a*: 13. Syntype workers, SOUTH WEST AFRICA: Okahandja (*Peters*), and no loc. (*Lübbert*) (MHN, Geneva) [examined].

MEDIUM TO LARGE WORKER, HW 2.00– > 3.00.

Anterior clypeal margin flattened to slightly indented medially. With the head in full-face view the sides more or less straight, roughly parallel or weakly convergent anteriorly. Occipital margin distinctly indented medially in large workers but the indentation becoming obliterated with reduced size. In HW range 2.00–3.12 the maximum diameter of the eyes 0.38–0.50, about 0.15–0.18 × HW, and the CI is 100–112. With the propodeum in profile the dorsum rounding narrowly into the declivity to meeting the declivity in a right-angle; propodeal armament never developed. Dorsum of head everywhere finely and densely longitudinally rugulose, the rugulae approximately parallel and becoming finer away from the mid-dorsal strip. Ground-sculpture of minute punctulation is present between the rugulae but this is less conspicuous in some samples than in others. Pronotal dorsum weakly and faintly to quite strongly transversely rugulose, but always with a fairly distinct punctulate component between the rugulae. Mesonotum smooth with only vestigial traces of sculpture to irregularly granular, only rarely with a rugular component. Propodeal dorsum transversely rugulose to rugose, with punctures between the rugulae. First gastral tergite unsculptured except for the fine superficial reticular patterning which is usual in the genus. With the head in full-face view the sides and occipital margin lacking projecting hairs. Projecting hairs very sparse to absent on dorsum of head but present on mouthparts and between frontal lobes. Psammophore strongly developed. On dorsal alitrunk the pronotum with 0–4 pairs of hairs, the mesonotum with 2–6 pairs; the propodeum, petiole and postpetiole lacking hairs. First gastral tergite without hairs or at most with 2–3 at the extreme apical margin of the sclerite. Colour usually red with a blackish gaster but in some the gaster the same shade of red as the head and alitrunk. Shade of red of head and alitrunk varying from bright, almost orange, to very dull.

This very distinctive species is extremely widespread in the southern half of the African continent. It is immediately recognizable by its strongly sculptured head and very reduced pilosity. Of the sparsely hairy species of Africa only *collingwoodi* from Mali and Niger has the head anywhere near as strongly sculptured as *luebberti*, but in that species the propodeum has hairs and the junction of propodeal dorsum and declivity is armed with a pair of short spines.

MATERIAL EXAMINED

Tanzania: Dodoma (*A. Loveridge*). **Zimbabwe:** Bulawayo (*G. Arnold*); Springvale (*G. Arnold*). **Botswana:** Damara Pan (*G. U. Son*); Kuke Pan (*G. U. Son*); Gomodimo (*G. U. Son*); Xani Pan (*A. Russell-Smith*). **Angola:** Cahama (*E. S. Ross & R. E. Leech*). **South West Africa:** Gemsbok Pan (*G. U. Son*); Okahandja (*Peters*); no loc. (*Lübbert*); Windhoek (*Ross & Stephen*). **South Africa:** Transvaal, Shiluvane (*Junod*); Malagieskraal (*Lingnau*); Pretoria; Pietersburg (*E. S. Ross & R. E. Leech*).

Messor piceus Stitz

Messor piceus Stitz, 1923: 150. Syntype workers, female, SOUTH AFRICA: Transvaal (*Ulrich*) [not found in MNHU, Berlin, presumed lost].

MEDIUM TO LARGE WORKER, HW 3.28– > 4.20.

Answering to the description of *capensis*, but differing mainly in the colour of the body pilosity which is white to yellowish in *capensis* but very deep red-brown to blackish in *piceus*. Apart from this the anterior clypeal margin is indented medially in *piceus*; the propodeum varies from narrowly rounded through right-angled to broadly and bluntly dentate, and the largest known workers are larger than those of *capensis*. In the HW range 3.28–4.20 the maximum diameter of the eye is 0.54–0.64, about 0.15–0.17 × HW, and the CI range is 106–119. The maximum known for *capensis* is HW 3.44 but this may not be the largest worker of the species, merely the largest available for study at present. Relative size of eye and CI fall within the range of *capensis*.

Unfortunately the type-series of *piceus* appears to be lost, but three short series from Transvaal match the original description tolerably well and show the dark pilosity noted by Stitz. I am therefore applying the name *piceus* to these specimens and to two other short series, from Natal and Botswana, noted under material examined.

M. piceus is a very closely related to *capensis* and *decipiens*; these three names may ultimately prove to represent only a single species.

MATERIAL EXAMINED

Botswana: Gomodimo (*Vernay-Lang*). **South Africa:** Natal, Pietermaritzburg (*Akerman*); Transvaal, Sabie; Kimberley (*G. Arnold*); Oliphants River, Grootdraai (*H. Lang*).

Messor regalis (Emery)

Cratomyrmex regalis Emery, 1891: 572, pl. 15, fig. 16. LECTOTYPE female, NIGERIA: Benue (*Staudinger*) (MCSN, Genoa), here designated [examined].

Cratomyrmex regalis var. *rubea* Santschi, 1913: 308. Holotype worker, BENIN REPUBLIC: no loc. (*Le Moult*) (NM, Basle) [examined]. **Syn. n.**

Cratomyrmex sculpturatus Stitz, 1916: 377, fig. 2. Syntype workers, CONGO: Fort Possel-Fort Crampel, xi.1910 (*Schubotz*); and Chûtes de la Nana, 'bei Fort Crampel', 7.xi.1910 (*Haberer*) (MNHU, Berlin) [examined]. **Syn. n.**

Messor regalis (Emery) Emery, 1922*a*: 357.

MEDIUM TO LARGE WORKER, HW 3.00– > 4.50.

Median portion of clypeus with anterior margin shallowly convex to somewhat flattened, irregular because of strong sculpture but not strongly impressed-concave. In HW range 3.00–4.40 the maximum diameter of the eye is 0.48–0.70, about 0.16–0.17 × HW, and the CI range is 109–115. With the head in full-face view the sides in front of the eyes more or less straight, roughly parallel or slightly convergent anteriorly. Behind the eyes the sides rounding very broadly and evenly into the occipital margin; the latter usually shallowly indented medially. Propodeum armed with a pair of short triangular spines. Dorsum of head densely sculptured everywhere with coarse parallel longitudinal rugulae. On the median strip behind the frontal lobes the rugulae tend to run straight back on the head; on each side of this strip they diverge towards the occipital corners. Pronotal dorsum coarsely sharply and irregularly rugose, frequently reticulate-rugose in places and generally with a strip of strong transverse rugae immediately behind the cervical shield. Remainder of dorsum and also sides of alitrunk strongly and generally sharply rugose everywhere, the sculpture stronger than on the dorsum of the head. Tergal portions of petiole and postpetiole very closely and coarsely irregularly rugose, the surfaces with a crumpled and wrinkled appearance. First gastral tergite rugulose to sharply costulate basally, the sculpture extending at least over the basal third of the sclerite and becoming finer posteriorly. All dorsal surfaces of head and body with numerous standing hairs, pilosity also dense on legs. With the head in full-face view projecting hairs are present on the sides behind the eyes, on the broad curve of the occipital corners and on the occipital margin itself. One or two hairs usually also project from the sides in front of the eyes. Psammophore conspicuously developed. Colour dull red to reddish brown, the gaster sometimes with an orange tint.

A species of West and Central Africa *regalis* is easily characterized by its blanketing coarse rugose sculpture. No other species in the region has sculpture approaching that found in *regalis*. This feature coupled with the dense pilosity and persistent propodeal spines renders the species quickly recognizable. Only *cephalotes* and *regalis* have extensive sculpture on the first gastral tergite; characters separating the two are given under *cephalotes.*

Some aspects of the biology of *regalis* have recently been investigated by Lévieux & Diomande (1978) and Lévieux (1979).

MATERIAL EXAMINED

Nigeria: K. State, N. Bussa (*J. T. Medler*); Mokwa (*C. Longhurst*); Olokemeji (*Bridwell*); Benue (*Staudinger*). **Benin Republic:** no loc. (*Le Moult*). **Congo:** Fort Crampel (*Schubotz*).

Messor ruginodis Stitz **stat. n.**, nomen dubium

Messor barbarus st. *ruginodis* Stitz, 1916: 374, fig. 1. Syntype workers, CONGO: Fort Crampel, xi.1910–6.i.1911 (*Schubotz*) [not found in MNHU, Berlin, presumed lost].

Apart from the very distinctive *regalis* this is the only other species of *Messor* recorded from the Congo. It is possible to decide from Stitz's description that *ruginodis* is related to *capensis* and its allies, but further placement cannot be attempted without the types as the description alone is not good enough. It must suffice for the present to state that, apart from *regalis*, no *Messor* species is known to extend its range into the Congo, so *ruginodis* remains an enigma.

As the species, whatever it really is, is definitely not closely related to *barbarus*, I have raised it to species-level here.

Messor striatifrons Stitz **stat. n.**

(Figs 27, 32)

Messor denticornis var. *striatifrons* Stitz, 1923: 149. Syntype workers, SOUTH WEST AFRICA: no loc. (*Scheben*) (MNHU, Berlin) [examined].

MEDIUM TO LARGE WORKER, HW 2.84– > 3.75.

Anterior clypeal margin usually shallowly convex medially but sometimes a weak central indentation of the margin is present. With the head in full-face view the sides convex. Generally the convexity is distinct (Fig. 27) in larger workers but tends to be less marked in smaller individuals; infrequently the reverse is true and medium sized workers show the convexity more strongly than larger specimens. Occipital margin shallowly indented medially, the indentation best developed in large workers and slowly disappearing with decrease in size. Within the HW range 2.84–3.76 the maximum diameter of the eye is 0.52–0.68, about 0.16–0.18 × HW, and the CI range is 104–114. Propodeum in profile relatively long and low (Fig. 32), usually rounded at the junction of dorsum and declivity but quite frequently right-angled or projecting into a broad short tooth which is really no more than a projection of the right-angle. Dorsum of head sculptured with extremely fine dense longitudinal rugulae which in the strongest sculptured individuals are very close packed. Spaces between the rugulae with fairly conspicuous ground-sculpture of fine punctures. In medium sized workers, and quite frequently in maximum sized workers also, the sculpture on the dorsal head is modified by a weakening of the rugular component and an intensification of the punctures, so that in some the rugular component is supressed and the head appears reticulate-punctate everywhere or almost everywhere. Dorsal alitrunk rugulose, the direction of the sculpture variable but usually stronger on the propodeum than elsewhere. First gastral tergite unsculptured or at most with the faint superficial patterning so commonly seen in this genus. All dorsal surfaces of head and body with numerous standing hairs; evenly distributed hairs conspicuous on first gastral tergite. Colour medium to dark brown, commonly uniform but often with the gaster darker, blackish brown.

A fairly distinctive member of the group of species centring on *capensis*, *striatifrons* is characterized by its relatively long low propodeum and convex head sides. The shape of the head is not duplicated in other African species but *denticornis* has a similarly proportioned propodeum. However, in this last-named species the eyes are larger, with a range of 0.21–02.5 × HW.

MATERIAL EXAMINED

South Africa: Cape Prov., Victoria West (*G. Arnold*); Steinkop (*G. Arnold*); Springbok (*E. S. Ross & R. E. Leech*); Picketberg (*E. S. Ross & R. E. Leech*); Citrusdal (*E. S. Ross & R. E. Leech*); Papendrop (*E. S. Ross & K. Lorenzen*); Clanwilliam (*E. S. Ross & R. E. Leech*). **South West Africa:** no loc. (*Scheben*).

Messor tropicorum Wheeler **stat. n.**

Messor barbarus subsp. *capensis* var. *tropicorum* Forel, 1910*b*: 444 [unavailable name]; Wheeler, 1922: 805 [*capensis* var. *tropicorum*, first available use of name]. Syntype workers, ANGOLA: Mossamedes (*Baum & Van der Kellen*) (MHN, Geneva) [examined].

Messor denticornis var. *laevifrons* Stitz, 1923: 148. Syntype workers, SOUTH WEST AFRICA: Usakos, iv.–vi.1911; and Grootfontein, 7–11.vi.1911 (*W. Michaelsen*) (MNHU, Berlin) [examined]. **Syn. n.**

Messor braunsi var. *nigriventris* Stitz, 1923: 150. Syntype workers, SOUTH WEST AFRICA: Grootfontein, 7–11.vi.1911 (*W. Michaelsen*) (MNHU, Berlin) [examined]. **Syn. n.**

MEDIUM TO LARGE WORKER, HW 3.00– > 3.80.

Anterior clypeal margin entire or at most with a feeble median indentation. With the head in full-face view the sides approximately straight, more or less parallel or feebly diverging anteriorly. Occipital margin usually broadly and shallowly concave but this becomes less apparent with decreased size. Centre of posterior half of clypeus, between the frontal lobes, with a conspicuously raised tumulus or welt in large workers, this feature decreasing in intensity with reduced size and not present in smaller workers. In the HW range 3.00–3.84 the maximum diameter of the eye is 0.64–0.72, about 0.19–0.21 × HW, and the CI range is 102–111. Propodeum in profile relatively short and high, like that of *capensis* (Fig. 31). Propodeal dorsum either rounding into declivity, or meeting it in a right-angle, or armed with a pair of short triangular teeth; variation occurs within series. Dorsum of head sculptured with narrow fine longitudinal rugulae. In strongest sculptured individuals the rugulae are dense and conspicuous, but often they are much reduced or partially to entirely effaced away from the central strip. Between the rugulae the ground-sculpture is of a fine superficial punctulation, often completely effaced. Dorsal alitrunk rugulose to rugose, the sculpture frequently weak on the pronotum or even absent in places. First gastral tergite unsculptured or at most with a faint superficial reticular pattering. All dorsal surfaces of head and body with numerous conspicuous standing hairs. Head and alitrunk reddish brown, the gaster darker.

Larger workers of *tropicorum* are quickly isolated by their possession of a strong prominent welt or tumulus posteromedially on the clypeus, but this character fades with reduced worker size. The eyes are quite large, approaching the lower limit of the range seen in *denticornis*, but in the latter the propodeum is longer and lower in profile.

MATERIAL EXAMINED

South West Africa: Kabiras (*R. W. E. Tucker*); Usakos (*W. Michaelsen*), Grootfontein (*W. Michaelsen*). **Angola:** Mossamedes (*Baum & Van der Kellen*).

CATAULACUS F. Smith

Cataulacus F. Smith, 1853: 225. Type-species: *Cataulacus taprobanae* F. Smith, 1853: 225, by subsequent designation of Bingham, 1903: 120.

For diagnosis of genus, current synonymy and generic revision see Bolton (1974). For some time I have been unhappy about the treatment which I gave to some species in the *C. tenuis*-group of Africa (Bolton, 1974). It has become apparent, with the acquisition of more material and with further experience of the group, that I was wrong to synonymize some of the names. The opportunity to rectify these mistakes now presents itself and the changes from the previous system are summarized below. Following this six new species are described and a revised key to the Afrotropical species is provided which reflects these additions and changes, and which includes also the two African species recently described by Snelling (1979). The new key only deals with the Afrotropical fauna; it excludes the Malagasy species which were incorporated in the former (1974) key. For identification of such species the reader is referred back to the earlier study.

Key to species (workers)

1 Dorsal alitrunk without standing hairs of any description or at most with only 1–2 very short hairs at the highest point of the pronotum. Generally hairs absent from alitrunk but rarely sparse strongly appressed hairs may be present 2

— Dorsal alitrunk with numerous standing hairs which are usually conspicuous. If the standing hairs are very short they are more or less evenly distributed over the dorsum and are not restricted to the highest point of the pronotum. 10

2 Propodeum completely unarmed, without trace of spines or teeth. (Zaire) . . . ***inermis*** Santschi

– Propodeum armed with a pair of spines or teeth . . . 3

3 Dorsal alitrunk strongly sulcate throughout. Appressed hairs present on the dorsal alitrunk. (Ghana) . . . ***adpressus*** Bolton

– Dorsal alitrunk reticulate-punctate to reticulate, usually also with fine rugulae or a rugoreticulum present; never sulcate. Appressed hairs absent from dorsal alitrunk . . . 4

4 Petiole dorsally strongly transversely rugose or sulcate everywhere . . . 5

– Petiole dorsally variously sculptured but never transversely strongly rugose or sulcate . . . 7

5 First gastral sternite laterobasally with a longitudinal margination or carina which parallels the laterobasal margination of the first tergite. Femora of hind legs not excessively anteroposteriorly compressed . . . 6

– First gastral sternite laterobasally without a longitudinal margination or carina which parallels the laterobasal margination of the first tergite. Femora of hind legs strikingly anteroposteriorly compressed, narrow and very deep. (Sierra Leone, Cameroun, Equatorial Guina, Congo, Zaire, Uganda) . . . ***kohli*** Mayr

6 Sides of head behind eyes irregular, either denticulate, crenulate or otherwise jagged. Relatively broader-headed species, CI > 125, the head strongly broadened behind the eyes. Laterally projecting hairs on sides of head behind eyes long and conspicuous. (Sierra Leone, Ghana, Nigeria, Cameroun, Uganda, Zaire, Zambia) . . . ***huberi*** André

– Sides of head behind eyes regular, smooth, neither denticulate nor crenulate. Relatively narrower-headed species, CI 120 or less, the head not strongly broadened behind the eyes. Laterally projecting hairs on sides of head behind eyes minute and inconspicuous or absent. (Ghana, Nigeria, Cameroun, Uganda, Congo, Zaire) . . . ***egenus*** Santschi

7 Petiole and postpetiole in dorsal view strongly longitudinally sulcate. Postpetiole dorsally divided into two projecting lobes by a deep median longitudinal cleft. (Cameroun, Zaire) ***lobatus*** Mayr

– Petiole and postpetiole in dorsal view not strongly longitudinally sulcate. Postpetiole dorsally not divided into two projecting lobes by a deep median longitudinal cleft . . . 8

8 Lateral pronotal margination with 2 teeth. Dorsal and lateral surfaces of petiole and postpetiole with numerous tubercles and small angular prominences, presenting a multi-peaked and irregular surface. (Cameroun, Congo, Zaire, Kenya) . . . ***pullus*** Santschi

– Lateral pronotal margination with 0–1 teeth. Dorsal and lateral surfaces of petiole and postpetiole not equipped with tubercles and small angular prominences . . . 9

9 With the head in full-face view the lateral margins behind the eyes without a row of short projecting hairs. Lateral pronotal margination without teeth. (Ghana, Cameroun, Guinea, Zaire) . . . ***tardus*** Santschi

– With the head in full-face view the lateral margins behind the eyes with a row of short projecting hairs. Lateral pronotal margination with a single tooth on each side, close to the anterior pronotal corner. (Zaire) . . . ***theobromicolus*** Santschi

10 Petiole and postpetiole strongly transverse, much flattened dorsoventrally and without nodes, both very broadly thickly V-shaped in dorsal view. Propodeum armed only with a pair of small teeth or tubercles which are inconspicuous. (Sierra Leone, Liberia, Ghana, Nigeria, Cameroun, Zaire) . . . ***mocquerysi*** André

– Petiole and postpetiole nodiform, not strongly transverse nor flattened, not broadly V-shaped in dorsal view. Propodeal spines well developed and conspicuous . . . 11

11 Hairs on clypeus and usually also on remainder of cephalic dorsum bizarre, strongly clavate or stalked-suborbicular. In most the apex of each hair is very strongly swollen whilst the stem is narrow; sometimes the stem may be short or very short . . . 12

– Hairs on clypeus and remainder of cephalic dorsum simple, usually stout cylindrical and blunt but sometimes very short and stubble-like, sometimes elongate and fine and occasionally gradually increased in thickness from base to apex, but not strongly clavate or stalked-suborbicular . . . 20

12 With the alitrunk in dorsal view the pronotal margin on each side without an unbroken series of denticles which project laterally between the pronotal corner and the site of the promesonotal junction . . . 13

– With the alitrunk in dorsal view the pronotal margin on each side with an unbroken series of denticles which project laterally between the pronotal corner and the site of the promesonotal junction . . . 15

13 First gastral tergite regularly longitudinally sulcate throughout. (Cameroun) . . . ***jacksoni*** (p. 360)

– First gastral tergite reticulate-punctate or with fine rugulae overlying reticulate-punctate ground-sculpture, never longitudinally sulcate 14

14 Propodeal dorsum longitudinally rugulose. (Nigeria, Cameroun) . . . . . ***vorticus*** Bolton

– Propodeal dorsum transversely rugose. (Nigeria) . . . . ***boltoni*** Snelling

15 Bizarre hairs on dorsum of head behind clypeus with a very short basal stem, appearing stud-like, the swollen apices set very close to the cephalic surface 16

– Bizarre hairs on dorsum of head behind clypeus with an elongate basal stem, never short and stud-like, the swollen apices conspicuously raised well clear of the cephalic surface . . . 17

16 Larger species, HW 0.80 or more. (Tanzania, Zimbabwe, Angola, South Africa) ***brevisetosus*** Forel

– Smaller species, HW < 0.80. (Ivory Coast, Ghana, Cameroun, Uganda, Kenya, Tanzania, Angola) . . . . ***jeanneli*** (p. 358)

17 Dorsal alitrunk with weak rugulose sculpture and a blanketing dense reticulate-punctate ground-sculpture which is very conspicuous between the rugulae, the surface matt and dull . 18

– Dorsal alitrunk with strong dense rugose sculpture the spaces between which are unsculptured or at most contain some feeble superficial ground-sculpture, the surface glossy . . . 19

18 Denticles on lateral pronotal margins minute and inconspicuous in dorsal view, much smaller than the tooth at the pronotal corner. (Cameroun) . . . . ***satrap*** (p. 363)

– Denticles on lateral pronotal margins large and conspicuous, at least as large as the tooth at the pronotal corner, sometimes larger. (Ghana, Nigeria, Cameroun, Zaire) . . . . ***lujae*** (p. 358)

19 Smaller species, HW 0.80 or less. Body hairs relatively short (Fig. 34). Basal quarter of first gastral tergite without strong rugulae, either punctate or with feeble rugulae caused by alignment of punctures. Propodeal spines in profile evenly feebly curved. (Ghana, Nigeria) ***moloch*** (p. 361)

– Larger species, HW > 0.90. Body hairs relatively long (Fig. 33). Basal quarter of first gastral tergite with strong longitudinal rugulae which are independent of the underlying puncturation. Propodeal spines in profile with basal third elevated and apical two-thirds recurved. (Cameroun) . . . . ***centrurus*** (p. 359)

20 Erect hairs on dorsal surfaces of head, alitrunk and gaster abundant, dense, very long narrow and fine, curved or even sinuate, the entire ant with a softly pilose appearance rather than the bristly appearance usually associated with this genus 21

– Erect hairs on dorsal surfaces of head, alitrunk and gaster relatively sparse, short broad and blunt, coarse and usually straight, the entire ant with a bristly or stubbly appearance . . 22

21 Propodeal dorsum longitudinally rugulose or rugose. Larger species, HL > 0.90, HW > 0.85. (Ghana, Cameroun, Angola) . . . . ***elongatus*** Santschi

– Propodeal dorsum transversely rugulose. Smaller species, HL < 0.90, HW < 0.85. (Zaire) ***pilosus*** Santschi

22 Head relatively broad or very broad, the eyes small, CI > 112, OI < 30. In dorsal view the posterolateral portion of the pronotal margin produced into a large spine or triangular prominence. Propodeal spines long and very strong, not dorsoventrally flattened . . . 23

– Head relatively narrow and eyes larger, CI 110 or less, OI > 32. In dorsal view the posterolateral portion of the pronotal margin usually armed with a short tooth or a denticle. When a short tooth is present in this position it is usually comparable in size with others on the pronotal margin. Propodeal spines usually dorsoventrally flattened, only rarely otherwise 24

23 Sculpture of dorsal alitrunk a very distinct rugoreticulum with strongly reticulate-punctate interspaces. Lateral margins of mesonotum usually with one or more denticles. (Liberia, Ghana, Cameroun, Equatorial Guina, Gabon, Congo, Zaire). . . . . . ***erinaceus*** Stitz

– Sculpture of dorsal alitrunk variable in intensity but consisting essentially of a longitudinal rugation or sulcation which may be irregular or sinuate. Lateral margins of mesonotum usually without denticles. (Ivory Coast, Liberia, Ghana, Nigeria, Cameroun, Equatorial Guinae, Zaire, Uganda) . . . . ***guineensis*** F. Smith

24 Posterior one-quarter of first gastral tergite coarsely longitudinally sulcate, rugose or striate, this sculpture always very distinct and usually extending to the apex of the tergite . . . 25

– Posterior one-quarter of first gastral tergite reticulate-punctate or finely superficially sculptured and shining; a few fine scattered longitudinal rugulae formed by the fusion of the margins of aligned punctures may sometimes be present. 27

25 Smaller species, HW < 0.90, with relatively large eyes, OI 50 or more. (Zaire, Kenya) ***striativentris*** Santschi

– Larger species, HW > 0.95, with relatively smaller eyes, OI in range 34–48 26

26 Dorsal surfaces of head and alitrunk with numerous conspicuous relatively long stout hairs. Eyes slightly larger, OI range 43–48. (Kenya, Mozambique, South Africa) . . ***wissmanni*** Forel

– Dorsal surfaces of head and alitrunk with relatively few inconspicuous very short stubbly hairs. Eyes slightly smaller, OI range 34–40. (Ethiopia, Somali Republic, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique, Angola, South West Africa, South Africa) ***intrudens*** (F. Smith) (part)

27 Occiput with a distinct deeply incised transverse groove above the foramen. Below this the remaining strip of the occiput juts out as a shield over the dorsal rim of the foramen itself. (Uganda) . . . . ***impressus*** Bolton

– Occiput without a deeply incised transverse groove above the foramen 28

28 Subpetiolar process complex, anteroventrally with a prominent broadly rounded angle and posteroventrally with an extended heel or spur; the surface between these two usually concave. Postpetiole with a strongly developed simple long digitiform ventral process . . 29

– Either the subpetiolar process simple, a rectangular or subrectangular lobe without the above configuration or with a feebly prominent acute angle or small tooth posteroventrally; if the latter then the postpetiole with a short blunt or short tooth-like ventral process . . . 35

29 Eyes relatively small, OI < 50 30

– Eyes relatively large, OI 50 or more 32

30 Propodeal spines long, 0.40 or more in profile (in HW range 1.10–1.26), strongly divergent and markedly elevated; in profile the spines distinctly longer than the maximum length of the petiole. (Cameroun, Zaire) . . . . ***greggi*** Bolton

– Propodeal spines short, < 0.25 in profile (in HW range 0.90–1.04), not strongly divergent nor markedly elevated; in profile the spines distinctly shorter than the maximum length of the petiole 31

31 Stout hairs on cephalic dorsum extremely dense, appearing as a bristly pelt in profile. A line across the dorsum at the midlength of the eyes with many more than 10 hairs. Hairs on dorsum of head more or less cylindrical, not spatulate; the hairs truncated apically, their sides more or less straight and parallel. (Zaire) . . . . ***cestus*** (p. 360)

– Stout hairs on cephalic dorsum sparse, not giving the appearance of a bristly pelt in profile. A line across the dorsum at the midlength of the eyes with at most 10 hairs. Hairs on dorsum of head conspicuously spatulate, broadly convex apically, their sides shallowly convex and convergent basally. (Kenya) . . . . ***kenyensis*** (p. 358)

32 Most or all of stout hairs on clypeus and dorsum of head increasing markedly in thickness from base to apex, frequently 2–3 times broader at apex than at base. (Sierra Leone, Ghana, Cameroun, Chad, Zaire) . . . . ***pygmaeus*** André

– Most or all of stout hairs on clypeus and dorsum of head cylindrical or nearly so, not increasing markedly in thickness from base to apex; in some cases the hairs may broaden approximately to their midlength and then continue at that width to their apices 33

33 Mesonotal and propodeal dorsa with very fine superficial low irregular weak wandering rugulae, feeble or faded out in places but never evenly spaced nor regularly longitudinal. Spaces between these fine rugulae densely strongly reticulate-puntate and dull. (Ghana, Congo, Zaire) . . . . ***weissi*** (p. 358)

– Mesonotal and propodeal dorsa with conspicuous strong broad longitudinal rugae which may be parallel but which are never faded out in places. Spaces between the rugae weakly superficially sculptured or unsculptured, the surfaces shining 34

34 Entire body exceptionally highly polished and very shiny. Longitudinal rugae on posterior half of mesonotum and on propodeum very broad, subsulcate and parallel, without anastomoses on the prodpodeum. (Nigeria) . . . . ***taylori*** (p. 364)

– Dully shining, not obviously highly polished. Longitudinal rugae on posterior half of mesonotum and on propodeum not subsulcate, not parallel, tending instead to diverge and converge slightly along their lengths or to be weakly wavy; on the propodeum with anastomoses. (Benin Republic) . . . . ***difficilis*** Santschi

35 Hairs on dorsum of head exceptionally short, forming only a minute stubble on the surface. Dorsum of head usually meeting occipital surface in a marked angle or edge, the one not rounding evenly into the other 36

– Hairs on dorsum of head conspicuous and quite dense, not represented only by a minute stubble on the surface. Dorsum of head rounding into occipital surface 37

36 Tooth on mesokatepisternum large, long and acute, projecting anteriorly and usually clearly visible in dorsal view, projecting beyond the margins of the mesonotum. (South Africa) ***micans*** Mayr

– Tooth on mesokatepisternum small and short, usually a mere denticle or acute angle, sometimes not even as strong as this; not visible in dorsal view. (Ethiopia, Somali Republic, Kenya, Tanzania, Malawi, Zimbabwe, Mozambique, Angola, South West Africa, South Africa) . . . . ***intrudens*** (F. Smith)

37 Larger species, HW > 1.10, PW > 0.90. (Zaire). . . . . ***bequaerti*** Forel

– Smaller species, HW < 1.10, PW < 0.90 38

38 Pronotum laterally with a number of irregular rounded tuberculiform projections, without a regular series of denticles although some of the projections appear to consist of 2 or more denticles fused together. (South Africa) . . . . ***fricatidorsus*** Santschi

– Pronotum laterally with a more or less regularly spaced series of denticles 39

39 Dorsal surfaces of mesonotum and propodeum extremely finely and very densely more or less evenly longitudinally rugulose, the rugulae so close together that the spaces between them are wide enough for only 1–2 rows of punctures. (Cameroun) . . . . . . ***mckeyi*** Snelling

– Dorsal surfaces of mesonotum and propodeum coarsely rugose, the rugae predominantly longitudinal but with some strong cross-meshes, breaks or irregularities. The rugae widely spaced so that the spaces between most of them accomodate many more than 2 rows of punctures. (Ghana, Nigeria, Cameroun, Zaire, Sudan, Uganda, Tanzania, South Africa) ***traegaordhi*** (p. 358)

Cataulacus lujae Forel **sp. rev.**

Cataulacus lujae Forel, 1911*b*: 311. Syntype workers, ZAIRE: Kasai, Kondue (*Luja*) (MHN, Geneva) [examined]. [Wrongly synonymized with *brevisetosus* Forel by Bolton, 1974: 31.]

C. lujae var. *gilviventris* Forel should be included as a synonym of *lujae*, not of *brevisetosus*.

Cataulacus jeanneli Santschi **sp. rev.**

Cataulacus jeanneli Santschi, 1914*a*: 108, fig. 16. Holotype worker, KENYA: Gazi, 20 km S. of Mombasa, st. no. 6, xi. 1911 (*C. Alluaud & R. Jeannel*) (NM, Basle) [examined]. [Wrongly synonymized with *brevisetosus* by Bolton, 1974: 31.]

The names *pygmaeus* st. *degener* Santschi and *janneli* [sic] var. *loveridgei* Santschi should be included in the synonymy of *jeanneli*, not of *brevisetosus*. The types of *loveridgei* still have not been found; the holotype of *brevisetosus* has now been located in MHN, Geneva.

Cataulacus weissi Santschi

Cataulacus weissi Santschi, 1913: 310. Holotype worker, CONGO: Brazzaville, 1907 (*A. Weiss*) (NM, Basle) [examined].

Cataulacus jeanneli var. *aethiops* Santschi, 1924: 220. Syntype workers, ZAIRE: Kidada-Kitobola, 14–25.ii.1922 (*H. Schouteden*) (MRAC, Tervuren) [examined]. **Syn. n.**

Cataulacus kenyensis Santschi **stat. n.**

Cataulacus jeanneli st. *kenyensis* Santschi, 1935: 272, figs 6a–c. Syntype workers, KENYA: Nairobi, st. 2, 1660 m, 1932–33 (*C. Arambourg, P. Chappuis & R. Jeannel*) (NM, Basle) [examined]. [Wrongly synonymized with *weissi* by Bolton, 1974: 39.]

Cataulacus traegaordhi Santschi **sp. rev.**

Cataulacus traegaordhi Santschi, 1914*b*: 24, fig. 3. Syntype workers, female, male, SOUTH AFRICA: Natal, Zululand, Dukudu, 27.vii.1905 (*I. Trägårdh*) (NM, Basle) [examined]. [Wrongly synonymized with *pygmaeus* André by Bolton, 1974: 48.]

Of those names formerly included as synonyms under *pygmaeus*, the forms *C. trägårdhi* [sic] var. *ugandensis* Santschi, *C. marleyi* Forel (types in MHN, Geneva, not previously seen), and *C. pygmaeus* subsp. *suddensis* Weber should now be included in the synonymy of *traegaordhi*, not of *pygmaeus*.

Cataulacus centrurus sp. n.

(Fig. 33)

HOLOTYPE WORKER. TL 3.9, HL 1.00, HW 0.92, CI 92, EL 0.47, OI 51, SL 0.48, SI 52, PW 0.70, AL 1.10.

With the head in full-face view the lateral margins of the head behind the eyes denticulate, terminating posteriorly in a short tooth at the occipital corner. Occipital crest absent, the dorsum of the head rounding evenly but narrowly into the occipital surface; the occipital margin itself unarmed except for a small tooth situated close to the tooth at the corner. Eyes relatively large, OI > 50. Alitrunk with promesonotum both longitudinally and transversely convex. In profile the highest point at about the midlength of the pronotum, the remainder sloping evenly downwards posteriorly to the base of the propodeal spines. Anterior strongly curved portion of pronotal dorsum with a number of minute peaks or tubercles from which hairs arise; such peaks absent elsewhere on alitrunk. Tooth at base of mesokatepisternum developed. Propodeal spines in profile with the basal third elevated at an angle of about 45°, the apical two-thirds back-curved. Metapleural lobes low and rounded. With the alitrunk in dorsal view the pronotal corners denticulate and the lateral margins of the pronotum armed with a series of 6–7 regularly spaced triangular denticles. Lateral margins of mesonotum with a pair of small denticles whose bases are fused, situated at approximately the midlength. Following the metanotal identation of the margin the sides of the propodeum are equipped with 2–3 small tubercles. Propodeal spines in dorsal view broad and evenly divergent. Petiole in profile rising to a sharp peak dorsally, behind which the surface slopes evenly downwards to the postpetiolar junction. Subpetiolar process with a bluntly rounded anterior lobe and a weakly developed posteroventral tooth. Postpetiole in profile with its dorsal and posterior surfaces tuberculate and its ventral process simple, short digitiform. First gastral tergite not marginate laterally, conspicuously longer than broad. Dorsum of head finely and evenly reticulate-rugulose, the recticular meshes of irregular size and the rugulae low and rounded. Ground-sculpture in the meshes reduced to an inconspicuous vestigial superficial shagreening, without punctulae. Pronotal dorsum similarly but somewhat more strongly sculptured, the reticulum breaking down on the mesonotum so that the longitudinal component predominates and the cross-meshes are reduced or incomplete. Propodeal dorsum more strongly and predominantly longitudinally rugose, irregular centrally. Transverse rugae are present between the bases of the propodeal spines. Ground-sculpture of alitrunk mostly as head but the mesonotum with some minute and virtually effaced punctulae. Petiole in dorsal view longitudinally rugose, the sculpture converging posteriorly. Postpetiole dorsum irregularly rugulose. First gastral tergite blanketed by fine dense reticulate-punctate sculpture, the basal quarter also with widely spaced fine longitudinal costulae. Behind this level the tergite with scattered short longitudinal rugulae which are very fine and irregular and formed by the alignment of the margins of adjacent punctures. First gastral sternite reticulate-punctate. Sides of pronotum obliquely sulcate, the mesopleuron transversely sulcate and the sides of the propodeum more or less vertically so behind the level of the spiracle. Sides of petiole and postpetiole longitudinally sulcate-rugose. Discounting the long simple hairs which arise round the eyes the entire dorsum of the head thickly clothed with stalked-suborbicular hairs, the stems of the hairs long and fine and holding the suborbicular distal portions well clear of the surface of the head. Occipital surface with a number of elongate narrowly clavate hairs. All remaining dorsal surfaces of body densely clothed with moderately long stout cylindrical simple hairs which are truncated apically; those on the alitrunk and petiole straight, those on the postpetiole and first gastral tergite weakly back-curved. Colour uniform black, glossy; the scapes, tibiae and tarsal segments dull yellow.

Holotype worker, **Cameroun:** Nkoemvon, 1979 (*D. Jackson*) (BMNH).

As indicated by the stalked-suborbicular cephalic hairs *centrurus* belongs to the complex of species centring on *brevisetosus*, and is most closely related to the smaller *moloch*. In the latter species the simple pilosity of the alitrunk and gaster is very short and stubble-like, whereas in *centrurus* it is long and conspicuous (Figs 33, 34). The specialized cephalic hairs of *moloch* are sparser than in *centrurus*, have the basal stems of the hairs shorter and the apices less strongly expanded. With the head in profile the specialized hairs immediately in front of the eye have the basal stem longer than the swollen apex in *centrurus*, shorter than the swollen apex in *moloch*. In profile the propodeal spines of *centrurus* have the basal third elevated and the apical two-thirds recurved, a feature not seen in *moloch* where the spines are exceedingly feebly but evenly curved along their length. Finally, the shape of the subpetiolar process differs in the two species, that of *moloch* having the posteroventral angle more salient and the ventral surface more concave than in *centrurus*.

Cataulacus cestus sp. n.

HOLOTYPE WORKER. TL 4.0, HL 1.00, HW 0.99, CI 99, EL, 0.45, OI 45, SL 0.48, SI 48, PW 0.76, AL 1.10.

Sides of head behind eyes denticulate, terminating in a larger denticle at the occipital corner. Occipital crest absent but the occipital surface shallowly concave above the foramen and meeting the dorsum in an angle, the two surfaces not evenly rounded together. Occipital margin unarmed except for a denticle or short tooth close to the one at the corner. Eyes relatively small, OI < 50. With the alitrunk in profile the dorsum evenly shallowly convex between the more steeply sloped anterior portion of the pronotum and the base of the propodeal spines. Pronotal and propodeal surfaces beset with small peaks or tubercles in profile, the mesonotal dorsum also having such peaks but they are here more scattered and much lower, having the appearance of minute irregularities in the outline. Mesokatepisternal tooth small. Metapleural lobes rounded. Propodeal spines in profile short, more or less straight, only very slightly elevated. Alitrunk in dorsal view with the pronotal corners denticulate, the lateral marginations of the pronotum behind the corners with 6–7 sharp triangular denticles projecting laterally. Sides of mesonotum with 1–2 small denticles and sides of propodeum also with 1–2, occurring on the convexity over the spiracle. Propodeal spines short and broad, widely divergent. Petiole node in profile rising to an acute peak dorsally. The subpetiolar process with a rounded and slightly prominent anteroventral lobe and a triangular projecting posteroventral tooth or heel; the ventral surface between the two angles feebly concave. Postpetiole in profile high, its dorsal surface with a number of conspicuous peaks or tubercles and its ventral process short-digitiform. Dorsum of head irregularly reticulate-rugose, the meshes of varying size and the rugae low and rounded. Many of the reticular meshes incomplete or with their walls broken. Ground-sculpture within the meshes a very fine superficial shagreening or granular roughening of the surface, not reticulate-punctate. Dorsal alitrunk irregularly reticulate-rugose everywhere, many of the rugular meshes incomplete or broken and very irregular in shape. Ground-sculpture finely reticulate-punctate to densely shagreened. Petiole node in dorsal view strongly longitudinally rugose, the rugae converging posteriorly. Postpetiole irregularly rugulose and finely densely punctulate. First gastral tergite coarsely and densely reticulate-punctate everywhere, the whole surface also loosely covered with anastomosing fine irregular superficial rugulae which are strongest basally and fade out apically on the sclerite. First gastral sternite similarly sculptured. Entire dorsum of head covered with a dense pelt of short straight erect bristly blunt hairs which are cylindrical to subcylindrical in shape. All remaining dorsal surfaces of body with similar dense bristly pilosity. Colour uniform black; the scapes, tibiae and tarsi dull yellow.

PARATYPE WORKERS. TL 4.0–4.1, HL 0.98–1.02, HW 0.98–1.02, CI 98–100, EL 0.45–0.48, OI 46–47, SL 0.48–0.50, SI 49–51, PW 0.76–0.86, AL 1.08–1.16 (4 measured).

As holotype but in some the gastral rugulae are less strongly developed and in one the gastral rugulae are effaced. The ventral surface of the subpetiolar process may be more strongly concave than is the case with the holotype.

Holotype worker, **Zaire** (B. Congo on data label): Ituri For., Beni-Irumu, ii.1948, no. 2122 (*N. A. Weber*) (MCZ, Cambridge).

Paratypes. 1 worker with same data as holotype; 1 worker with same data as holotype but no. 2120; 2 workers with same data as holotype but no. 2119. (MCZ, Cambridge; BMNH).

Cataulacus jacksoni sp. n.

HOLOTYPE WORKER. TL 3.5, HL 0.98, HW 0.94, CI 96, EL 0.46, OI 50, SL 0.49, SI 52, PW 0.68, AL 0.98 (cephalic measurements approximate as head crushed).

With the head in full-face view the sides behind the eyes minutely denticulate. Occipital crest absent, the dorsum rounding into the occipital margin. Head of holotype crushed behind level of eyes and the surface fractured; the fracture also running forward on the head along the inner margin of the right eye to the clypeus. With the alitrunk in profile the dorsal outline rising steeply to about the midlength of the pronotum. Behind this the remainder of the dorsum evenly shallowly convex to the bases of the propodeal spines, the outline not interrupted by superficial peaks or tubercles. Mesokatepisternal tooth small and broadly triangular. Propodeal spines in profile strongly downcurved along their length. Metapleural lobes very small. With the alitrunk in dorsal view the pronotal corners angular, the angle slightly projecting. Sides of pronotum behind this not marginate, without a regular series of laterally projecting denticles. Instead the sides with only a blunt tubercle at the point of junction of the pronotum and mesonotum and with one or two minute irregularities, too low, small and blunt to be called tubercles or denticles, situated behind the corner. Sides of mesonotum and propodeum unarmed and immarginate, the latter with a low salient welt at the site of the spiracle. Propodeal spines in dorsal view curved, bowed outwards along their length. Petiole in profile blunt above, not rising to a sharp peak. Subpetiolar process with the anteroventral angle rounded, the posteroventral angle acute and slightly projecting. Postpetiole in profile very high and narrow, with a flat anterior face and a long simple ventral process. In dorsal view the postpetiole with the sides converging dorsally so that the node narrows from base to apex. Dorsum of head to level of posterior margins of eyes finely longitudinally rugose, behind this level the head with very heavy broad strong sulci. Ventral surface of head longitudinally sulcate. Dorsal alitrunk regularly strongly longitudinally sulcate except for the area between the bases of the propodeal spines where the sulci are arched-transverse. Propodeal declivity transversely sulcate. Coxae, femora and tibiae of legs all longitudinally sulcate. Anterior face of petiole node transversely sulcate, the dorsum with U-shaped sulci. Upper half of anterior face of postpetiole vertically sulcate. Sides of alitrunk diagonally sulcate from anteroventral to posterodorsal on each sclerite except on the mesokatepisternum where they run from posteroventral to anterodorsal. First gastral tergite and first sternite covered with strong parallel longitudinal sulci throughout. Dorsum of head with abundant stalked-suborbicular hairs which have slender basal stems. Remainder of dorsal surfaces of body with sparse fine curved hairs which are very feebly clavate apically. Colour uniform black but scapes, anterior tibiae and tarsi, and tarsi of middle and hind legs dull yellow.

Holotype worker, **Cameroun:** Nkoemvon, 1980 (*D. Jackson*) (BMNH).

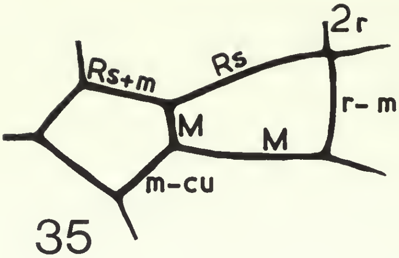
The characteristic strong sulcate sculpture of this species, coupled with its possession of immarginate and unarmed lateral pronotal margins, stalked-suborbicular cephalic hairs, and propodeal spines which are bowed outwards in dorsal view and downcurved in profile, make *jacksoni* very easily recognisable.

Cataulacus moloch **sp. n.**

(Fig. 34)

HOLOTYPE WORKER. TL 3.4, HL 0.90, HW 0.80, CI 89, EL 0.43, OI 54, SL 0.42, SI 53, PW 0.60, AL 0.94.

With the head in full-face view the sides behind the eyes denticulate, ending in a low triangular tooth at the occipital corner. Occipital margin with a small tooth close to the one at the corner but otherwise unarmed; the occipital crest absent, the dorsum rounding evenly into the occipital surface. Eyes relatively large, OI > 50. Alitrunk with promesonotum both longitudinally and transversely convex. In profile the alitrunk with its highest point at about the midlength of the pronotum, behind which the dorsum is evenly shallowly convex to the base of the propodeal spines. The steeply sloping anterior portion of the pronotal dorsum with a number of minute peaks or tubercles from which hairs arise, such peaks absent elsewhere on the dorsum. Tooth on mesokatepisternum moderately developed, distinct. Propodeal spines in profile scarcely elevated and almost straight, only very feeble downcurved along their length; not having the basal portions elevated and the distal portions recurved. With the alitrunk in dorsal view the pronotal corners with prominent acute dentiform angles. Pronotal margin behind the corners with 5–6 triangular, laterally projecting denticles which are quite evenly spaced. Sides of mesonotum with two small denticles, the sides of the propodeum convex over the site of the spiracles, with one or two minute tubercles. Propodeal spines broad in dorsal view and evenly divergent. Petiole in profile rising to an acute peak dorsally. Subpetiolar process complex, with a blunt and strongly prominent anteroventral angle and a tooth-like projecting posteroventral angle, the two separated by a conspicuously concave ventral margin. Postpetiole in profile with the dorsal and posterior surfaces distinctly denticulate, the subpostpetiolar process elongate-digitiform. Dorsum of head irregularly reticulate-rugulose, the reticular meshes of varying size and the rugulae themselves low and rounded. Ground-sculpture within the meshes reduced to an inconspicuous vetigial shagreening, without punctures. Pronotal dorsum similarly but more strongly sculptured, with a few low broad transverse rugae anteriorly but with the longitudinal component predominating behind this. On the mesonotum and propodeum the longitudinal component of the sculpture predominates, the rugae being broader and more strongly developed; many of the cross-meshes are feeble or incomplete. Rugae between bases of propodeal spines transverse. Petiole in dorsal view regularly longitudinally rugose, the rugae converging posteriorly; the postpetiole irregularly rugose. Ground-sculpture of alitrunk as on head. First gastral tergite blanketed by dense reticulate-punctation, without strong basigastral rugulae but here and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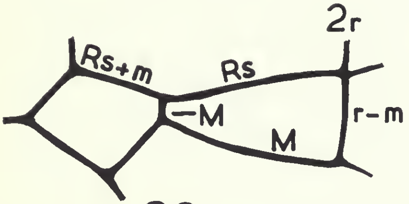
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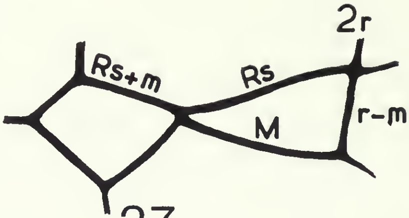
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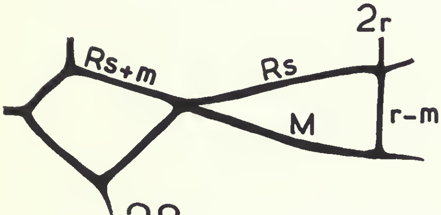
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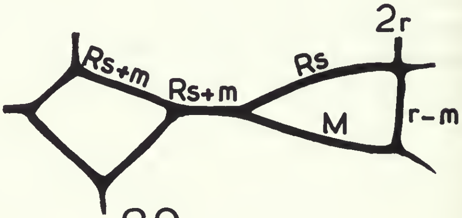
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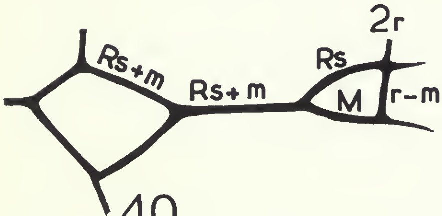
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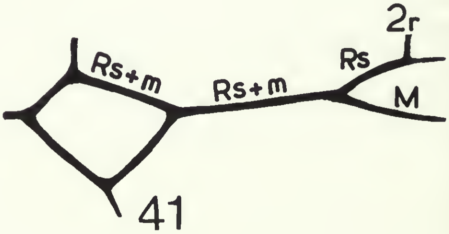
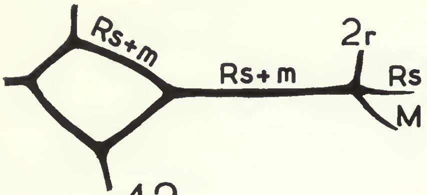
r-m

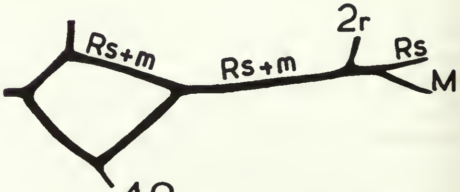
40


2r
Rs+m
Rs+m
Rs
M

41


Rs+m
2r
Rs+ m
Rs
M

42


2r
Rs+m
Rs+m
Rs
M

43

Figs 35–43 Semi-diagrammatic representation of principal venation development on forewing of *Messor* and *Aphaenogaster*. For explanation see text, pp. 339–340.

there with feeble short rugulae formed by the alignment of margins of adjacent punctures. First gastral sternite reticulate-punctate. Sides of pronotum transversely sulcate. Discounting the long hairs which arise around the eyes the dorsum of the head with numerous stalked-suborbicular hairs, the basal stems of which are quite short. Occipital surface with longer hairs which increase in thickness from base to apex. All remaining dorsal surfaces of body with numerous short stout blunt hairs. On the alitrunk some of these hairs are slightly thicker apically than basally, these hairs straight everywhere except on the base of the first gastral tergite where they are slighly back-curved. Colour uniform black; the scapes, tibiae and tarsi dull yellow.

PARATYPE WORKERS. TL 2.8–3.2, HL 0.74–0.86, HW 0.68–0.72, CI 86–92, EL 0.39–0.42, OI 54–57, SL 0.38–0.40, SI 53–56, PW 0.50–0.60, AL 0.78–0.92 (3 measured).

As holotype but averaging slightly smaller.

Holotype worker, **Ghana:** Pankese, 24.ix.1968 (*C. A. Collingwood*) (BMNH).

Paratype. **Ghana:** 1 worker with same data as holotype. **Nigeria:** 2 workers, Onipe, CRIN, 11.vi.1975, tree 47–16 (A63.1), black pod project (*B. Taylor*) (BMNH).

C. moloch is closest related to *centrurus*, the differences between them are noted under the latter name.

Cataulacus satrap sp. n.

HOLOTYPE WORKER. TL 3.5, HL 0.87, HW 0.82, CI 94, EL 0.44, OI 53, SL 0.40, SI 49, PW 0.56, AL 0.96.

With the head in full-face view the sides behind the eyes minutely denticulate, the denticles partially concealed by the thickened short hairs which project above them; the row of denticles ends in a small tooth at the occipital corner. Occipital crest absent, the dorsum of the head rounding into the occipital surface. Occipital margin unarmed except for a small tooth close to the one at the corner. Eyes relatively large, OI > 50. In profile the anterior outline of the pronotal dorsum sloping steeply, the surface equipped with a number of low peaks or tubercles. Behind this the remainder of the alitrunk shallowly but evenly convex, sloping down posteriorly to the base of the propodeal spines. Mesokatepisternal tooth prominent, moderately well developed. Metapleural lobes low and rounded. Propodeal spines in profile straight, only slightly elevated. With the alitrunk in dorsal view the pronotal corners angular and projecting. Sides of pronotum behind the corners only weakly marginate and with a series of 4–5 projecting denticles, all of which are small and widely spaced. In the holotype the right pronotal margin with 5, the left with 4 denticles. On both sides the posteriormost denticle the largest, the anteriormost distinctly smaller; the 2–3 between them minute and inconspicuous. Sides of mesonotum and propodeum without differentiated denticles. Propodeal spines in dorsal view broad and feebly divergent. Petiole in profile rising to an acute peak above. Subpetiolar process simple, with a bluntly rounded anteroventral angle and an acute, weakly projecting posteroventral angle, the two separated by a flat ventral surface. Postpetiole dome-like and high in profile, with two feebly developed peaks dorsally; the subpostpetiolar process short-digitiform and blunt. Dorsum of head irregularly reticulate-rugulose, the reticular meshes of uneven size and irregular shape, the rugulae low and rounded. Ground-sculpture of the rugular meshes a fine dense reticulate-puncturation. Dorsal alitrunk densely covered in fine rugulae which are low and rounded, reticulate in places but predominantly longitudinal behind the pronotum. Entire dorsum of alitrunk also blanketed by a fine dense and very conspicuous reticulate-punctate ground-sculpture. Petiole and postpetiole with dense reticulate-punctate sculpture, the former also with longitudinal rugae in dorsal view, the latter only with a few vestigial irregular rugulae. First gastral tergite strongly and densely reticulate-punctate everywhere. Dorsum of head with numerous distinctive stalked-suborbicular hairs, those situated anteriorly on the dorsum more strongly expanded apically than those situated behind the level of the eyes. All remaining dorsal surfaces of body with many very short thick blunt hairs. Colour uniform black, dull; the scapes, tibiae and tarsi dull yellowish brown.

PARATYPE WORKER. TL 3.4, HL 0.88, HW 0.80, CI 91, EL 0.43, OI 54, SL 0.40, SI 50, PW 0.57, AL 0.96.

As holotype but propodeal spines slightly less divergent and the subpetiolar process with the anteroventral and posteroventral angles separated by a feebly concave ventral surface. On the pronotal margins the anteriormost denticle behind the corner is no larger than those following it (except for the last in the row, which is the largest); and the left side of the pronotum with 5 denticles, the right side with 4.

Holotype worker, **Cameroun:** Nkoemvon, 1970, M12 (*D. Jackson*) (BMNH).

Paratype. 1 worker with same data as holotype (BMNH).

Related to *vorticus* which it resembles closely, *satrap* is immediately separated by its possession of denticles on the lateral pronotal margins.

Cataulacus taylori sp. n.

Holotype worker. TL 3.2, HL 0.82, HW 0.76, CI 93, EL 0.42, OI 55, SL 0.44, SI 58, PW 0.60, AL 0.90.

With the head in full-face view the sides behind the eyes denticulate, ending in a tooth at the occipital corner. Occipital crest absent, the dorsum rounding evenly into the occiput; the occipital margin unarmed except for a smaller tooth close to the one at the corner. Eyes relatively large, OI > 50. With the alitrunk in profile the highest point of the dorsum at about the midlength of the pronotum. In front of this the dorsum slopes down to the cervical shield and a few scattered minute peaks occur on the outline. Behind the highest point the dorsum is shallowly convex and slopes evenly downwards towards the bases of the propodeal spines. Mesokatepisternal tooth developed. Metapleural lobes low and rounded. Propodeal spines in profile narrow, slightly downcurved along their length. Alitrunk in dorsal view with the pronotal corners denticulate, the lateral margins of the pronotum with 6–7 projecting triangular denticles. Sides of mesonotum and propodeum each with a single projecting denticle, the latter also with the sides convex at the site of the spiracle. Propodeal spines narrow and evenly divergent in dorsal view. Petiole in profile rising to a sharp peak above. Subpetiolar process complex, with a narrow rounded projecting blunt anteroventral angle and a spur-like posteroventral angle, the ventral surface between the two angles strongly concave. Postpetiole node with dorsal surface denticulate, the ventral process narrow and digitiform. Dorsum of head feebly reticulate-rugulose, the rugulae very weak, fine, low and rounded, the reticular meshes mostly incomplete and irregular in shape and size. Ground-sculpture in the meshes almost completely effaced, the surface glossy. Dorsal alitrunk predominantly longitudinally rugose, with some anastomoses on the pronotum but behind this the rugae straight and parallel, quite broad and without cross-meshes. Spaces between the rugae glossy and almost smooth, with only the faintest vestiges of ground-sculpture. Rugae on declivity between bases of spines transverse. Petiole and postpetiole longitudinally rugose, the rugae converging posteriorly. First gastral tergite shiny, with superficial fine reticulate-puntulate sculpture everywhere and with a weak pattern of very fine longitudinal irregular rugulae. Stronger longitudinal rugulae present on the basal one-fifth of the tergite. First gastral sternite similarly but even more delicately sculptured. Dorsum of head with numerous short stout straight cylindrical hairs which are blunt apically. All remaining dorsal surfaces of body with similar pilosity, the longest hairs occurring on the base of the first gastral tergite where they are slightly recurved. Colour uniform glossy jet black; the scapes, tibiae and tarsi dull yellow.

Paratype worker. TL 3.5, HL 0.88, HW 0.81, CI 92, EL 0.45, OI 56, SL 0.46, SI 57, PW 0.67, AL 0.96.

As holotype but slightly larger, its subpostpetiolar process shorter and broader than in the holotype. The rugae on the dorsal alitrunk not running straight back as in the holotype but slightly skewed to the left posteriorly.

Holotype worker, **Nigeria:** Gambari, CRIN, 24.v.1976, black pod project (*B. Taylor*) (BMNH).

Paratype. **Nigeria:** 1 worker, Onipe, CRIN, 25.vii.1975, black pod project (*B. Taylor*) (BMNH).

Appendix

The current genus-level synonymy of *Aphaenogaster* is as follows.

APHAENOGASTER Mayr

Aphaenogaster Mayr, 1853: 107. Type-species: *Aphaenogaster sardoa* Mayr, 1853: 107, by subsequent designation of Bingham, 1903: 270.

Deromyrma Forel, 1913*c*: 49 [as subgenus of *Ischnomyrmex* Mayr]. Type-species: *Aphaenogaster* (*Ischnomyrmex*) *swammerdami* Forel, 1886*b*: cvi, by monotypy. [Synonymy by Brown, 1973: 180.]

Planimyrma Viehmeyer, 1914: 604 [as subgenus of *Aphaenogaster*]. Type-species: *Stenamma* (*Ischnomyrmex*) *loriai* Emery, 1897: 563, by original designation. [Synonymy by Brown, 1973: 184.]

Attomyrma Emery, 1915: 70 [as subgenus of *Aphaenogaster*]. Type-species: *Formica subterranea* Latreille, 1798: 49, by original designation. [Synonymy by Brown, 1973: 178.]

Novomessor Emery, 1915: 73. Type-species: *Aphaenogaster* (*Ischnomyrmex*) *cockerelli* André, 1893: 150, by original designation. [Synonymy by Brown, 1974: 47.]

Nystalomyrma Wheeler, 1916: 215 [as subgenus of *Aphaenogaster*]. Type-species: *Myrmica longiceps* F. Smith, 1858: 128, by original designation. [Synonymy by Brown, 1973: 183.]

Brunella Forel, 1917: 234. Type-species: *Aphoenogaster* [sic] *belti* Forel, 1895: 248, by original designation. **Syn. n.**

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